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THE BUILDER

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The Old and the New Year.

IN offering to all our friends and readers the best wishes for a happy and prosperous new year, it is gratifying to think that there is a reasonable hope that this year may be, for the majority and in a general sense, a prosperous one, and that those who are concerned in architecture and building will have their share in the general prosperity. Not only are there general signs that things, as the phrase is, "are looking up," but the mere fact, which will be present to every one's mind, that this is the year in which we are to have the pleasure of celebrating the attainment of the longest as well as one of the happiest reigns in the annals of the realm, must in itself do much to promote and quicken business of every kind.

The past year has not been architecturally a very eventful one. The most important incidents to record in it, in connexion with English architectural work, have been the two competitions which, though not for buildings of the first size or importance, attracted more than usual attention and interest; those, namely, for the Royal Insurance Offices and for the Technical School and additions to the Free Library; both at Liverpool. In regard to the latter, we publish in this issue the revised design by the successful competitor, Mr. Mountford, in which some slight alterations have been made from the original competition design published in our issue of August 8, 1896, and in which moreover the merits of the design are done more justice to in a better drawing. The building, when carried out, will be a very fine and effective addition to what is already a remarkable architectural group, though not all that it might have been had the original competition for the Free Library and Museum been carried on as well and ended as satisfactorily as this recent one has ended. In that old competition for the block of buildings of which Mr. Mountford's will form the completion some very fine designs were sent in, but instead of any one of them being selected, the then Borough Surveyor of Liverpool was allowed to make what use he could of the hints to be derived from the competition designs, to compile a rather commonplace design of his own. Although tricks of this kind are still occasionally played in small competitions, it would be hardly possible now to carry out such a policy with a large and important competition; there would be too much public feeling on the subject, and a large corporation would probably have more self-respect than to act in such a manner,* so that we may be justified in thinking that there has been some advance in the *morale* of competitions.

Two other events, of a very diverse character, will be remembered as occurrences of the past year. One of these is the scandal in connexion with the Works Committee of the County Council, into which an inquiry is now being held, so that any further remarks on the subject would be out of place and mistimed until this inquiry is concluded and the Committee's Report presented. But the circumstances which rendered the inquiry necessary, though happily not characterised

* We do not forget the discreditable affair at Durham; but Durham, though with a great cathedral, is a very small borough, and the affair hardly rose higher than a vestry competition.

by anything so flagrant as those which led to the downfall of the Metropolitan Board of Works, show unfortunately how strong is the tendency in a London official body of this kind, to mingle the proper carrying out of the business for which it was elected with a kind of party policy which seems to lead almost inevitably to the pulling of underhand wires to bring about, not the accomplishment of work, but the triumph of a party system. The London County Council was elected to do the practical municipal work of London; it has got itself more or less discredited, for the time, indirectly through a craze for mingling political and social partisanship with the carrying out of work; and it is to be hoped that the exposure of the incidents which have no doubt indirectly resulted from this policy will not be without a wholesome effect, in inducing the members of the London County Council to recognise the unsuitability of importing political aims into what should be simply an institution for the conduct of public works.

The other event to which we have alluded has been the excitement and discussion in regard to Peterborough Cathedral; indeed, 1896 may perhaps be remembered among architects as the Peterborough year. Looking back to our last year's volumes, we find that it was in the first number of January, 1896, that we went into the subject, and first suggested our opinion as to the possible ultimate outcome of the matter in the following words, which it will be admitted are guarded enough:—

"The mention of this point leads one to notice the possibility, which must be faced, that no way of making the work perfectly stable could be found without taking down the façade and rebuilding with the same stones, but on a proper foundation and with a better system of bonding. One almost dreads even to suggest such a thing, for fear of the opening that would be made for playing "restorative" tricks with the work in rebuilding. At the same time there is the fact that the facing stones are mostly in good condition and they could be numbered and reset, and that with proper care the front might remain in all essentials the old front set up again. To attempt to push the work into position by hydraulic jacks, as was done with the south wall of St. Albans, is not to be thought of; the mass is too great to be handled in that way, and even if the power could be applied, the first result of it would probably be to crush and bring down all the vaulting between the front and the west wall of the nave. The matter seems to rest between extensive underpinning combined with ties up above, or the radical cure of rebuilding. If only the latter operation were carried out as an honest piece of rebuilding—taking down the old stones and putting them together again, with no "restoration" frolics except the mere putting in of a new stone here and there in place of a decayed one, we are inclined to believe that no other process would be so satisfactory in the end, or give so long a new lease of life to the grand façade."

From that opinion, expressed twelve months ago and before there was any symptom of the outbreak of public criticism and letter-writing on the subject which has recently taken place, we see no reason to depart. The probability is that the piers are badly and hastily built, and the fact that they were on an equally bad foundation has probably been the means hitherto of saving them from worse damage than being pushed out of the perpendicular; the foundations gave instead of the piers cracking. Now the foundations have been rendered immoveable; it is proposed to make repairs and rebuilding in the superstructure which will increase its weight; and if the piers, as is probable, have little or no lateral bond, to do this is to put them between a pair of gigantic nut-crackers, which will crack the nut sooner or later. While referring to the subject, we may remark also on the extraordinary degree of ignorance and intolerance which has been shown in the correspondence and comments on the subject in various daily and weekly papers. It really seems as if, the less people know about building, the more right they think they have to lay down the law on the treatment of an ancient building. Things have got to a pass in this respect which is perfectly ludicrous. As an example of the absurd things that are said we have Mr. Pennell accusing the Dean and Chapter of Peterborough of having obviously intended from the first to pull down the façade, because he found a scaffolding all ready which had been there for months, he being apparently ignorant of the fact that the erection of a scaffolding is a necessary preliminary to the examination of the condition of the building. In a weekly paper (the *Speaker*) it is seriously suggested that if the Dean and Chapter prove contumacious the lesson will be that we must put our ancient buildings under the control of a National Commission, as in France; the writer being evidently unaware that the "Commission des Monuments Historiques" has carried "restoration" further than it has ever been carried in this country, almost obliterating the interest of many of the architectural monuments of France; and that Viollet-le-Duc, to whom the *Speaker* also refers with admiration, was a restorer more drastic even than Scott. The Dean and Chapter of Peterborough have in our opinion shown both firmness and judgment in their action, and a temper which contrasts very favourably with that of some of their violent and ill-informed critics.

In the coming year the most important subject before the Architectural world is that of the proposed New Government offices. Upon the general features of the site-schemes and the block-plans for their occupation, as set out in the Report of the Special Committee, we have already commented—favourably in regard to some, unfavourably in regard to others, especially that for the War Office. Nothing, however, is definitely settled yet; there is opportunity for improvement in the scheme, which it is to be hoped may yet be carried out in a manner worthy of the nation; and we have the satisfaction of knowing that the present First Commissioner of Works is fully alive to the architectural importance of the subject, and desirous that the new buildings should represent fine architecture as well as convenient offices. It is to be hoped that for these new Government offices there will be either a general or a limited architectural competition, and that it will be better managed and more satisfactory in its results than some previous competitions of the same kind.

Amid the various proposals which are in the air for doing something to commemorate this year of the Queen's reign, it is natural to consider whether any architectural monument significant of the occasion can be or should be erected. A new War Office, if adequately carried out in an architectural sense, would be important enough for the occasion, but would hardly form a suitable memorial of the reign of a Sovereign who has always and consistently wished and promoted peace as far as possible. We have had various suggestions made to us, but none of them worth taking into account. One correspondent suggested that a great building of some kind should be erected, on the ground that the present reign had not been marked by the erection of any great building of the first importance; a building called the Houses of Parliament having apparently escaped his recollection. But the suggestion reminds us that the Houses of Parliament has never been completed according to the architect's design, and we can think of few more suitable architectural memorials of the reign than would be furnished by its completion. Another suitable one might be the realising of the scheme, so often suggested in different forms, of a national Walhalla for the monuments of eminent persons, not in connection with Westminster Abbey, which is complete in itself, and would only be spoiled by a modern addition, but as a separate building. A third course which would be more to the purpose than either, and which is what would be certainly done in France or Germany, would be to carry out an artistic memorial of the Queen and her reign, purely as a work of art in architecture and sculpture, and as a monument only, without considering its practical use. This would be by far the most graceful way of doing it, and the most satisfactory in an artistic sense. We have the Albert Memorial—a remarkable work in its way in spite of some obvious defects; why should we not have the Victoria Memorial?

A NEW MUSEUM OF ANCIENT SCULPTURE.

BY PROFESSOR FURTWÄNGLER.

THE Glyptothek at Ny Carlsberg, near Copenhagen, founded by the well-known brewer, Herr Carl Jacobsen, is the latest Museum of ancient sculpture in Europe, and yet takes rank among the most important. It is, moreover, an outcome of the times, of which we may well feel proud. In past centuries, potentates collected statues for the adornment of their palaces. The practice inaugurated in Italy by princes, Popes, and cardinals, spread, under the influence of later Renaissance and Barocco architecture, to the Courts of France, of Spain, and of Germany, and, not least, to the English aristocracy. But to-day, a rich industrial competes with the grandees of a bygone age. And his collection of ancient sculpture is not destined to adorn a palace, but to minister at once to artistic enjoyment and scientific research. Its aim is to unfold before the visitor, by means of a noble series of well-selected examples, the whole development of Greek art. And this aim has been steadily kept in view. For Herr Jacobsen is enough of a connoisseur to appreciate above all what is intrinsically exquisite and beautiful; but he is also enough of a scholar to estimate at its right value what is significant for the historical study either of the development of form or of the mythological conceptions of the ancients.

To fulfil its aim such a collection must be conveniently exhibited, must be arranged on an easily grasped principle, and be made easy of access to all interested in art—all of which conditions are admirably fulfilled at

Ny Carlsberg. One requisite, however, was till lately wanting; in order that the scholar or the student who cannot undertake the pilgrimage to the collection of Ny Carlsberg might possess trustworthy reproductions of its works of art, a large publication must be started. In fact, the well known firm of Bruckmann in Munich has begun to publish the ancient monuments of the collection.* The three first parts, containing thirty large and splendidly executed plates in heliogravure, have already appeared, accompanied by an exhaustive text in French, itself richly illustrated, from the pen of Paul Arndt, a pupil of Heinrich Brunn.

The first *livraison* contains a selection from works of different epochs. As samples of the comprehensive character of the collection, which extends from Egyptian sculpture of the Old Empire down to late Roman sarcophagi and grave stones of Palmyra, we are given an Egyptian statue, a sitting Anubis of bronze, of uncommonly fine workmanship. An excellent sarcophagus of the later Roman Empire, from Sidon, displays on its front the contest of Apollo and Marsyas, while the portrait of the dead man —a certain Greek, by name Hermogenes, who has all the air of a Professor in a modern Academy of Music, and had probably devoted himself to the art—adorns the centre of the lid. A bronze statue of the youthful nude Herakles, reproduced on three plates, takes us to the efflorescence of Greek art. The statue, save for the bow and arrows once held in the left hand, is preserved intact; even the eyes, which consist of variegated substances, and were let in separately, are not lost, so that the figure preserves the life-like look wanting to so many statues, owing to the loss of the pupil in cases where it was let in, or to the disappearance of the colouring in others. The statue may be derived from a work in the manner and of the epoch of Skopas.

Another plate in this same *livraison* gives a small marble head from Athens, a charming, delicate original, probably by a pupil of Praxiteles.

A large portion of the collection consists of Roman copies after lost Greek masterpieces. In my book, "Die Meisterwerke der Griechischen Plastik," I had already referred to many of these pieces. Since then the indefatigable owner of the collection has acquired many new important works. Not only the villas and the palaces of the Roman aristocracy —of the Borghese and the Sciarra—but also the recent excavations in or near Rome have helped to enrich the Glyptothek of Ny Carlsberg. In the first *livraison* the most remarkable object of the class is the head of a goddess, in the severe style which recalls the figures from the pediments and metopes at Olympia.

In the second number the plates appear in stricter chronological order. Among the archaic sculptures, a place of honour is taken by the Early Attic head of a youth, which once belonged to the French archæologist Rayet; it is a work full of the strength and vitality which distinguish archaic art. From the archaic period, shortly before Pheidias, comes a draped female statue, which is closely related to the quiet, standing figures from the Olympian pediments and metopes. But the workmanship is finer and more precise; the ideal which inspired the Olympian figures finds in our statue clearer and purer expression. The statue is evidently an original; unfortunately, the head is missing; it seems to have been already restored in antiquity, probably in Rome where the statue was found; the neck is cut off straight, and shows a dowel hole; but in the period to which the work belongs heads were never adjusted in this fashion—a remark which the editor Arndt fails to make.

Still another original work of this period appears in the same number: the head of an anthropoid sarkophagos from Sidon, of Parian marble. As I have already noted in "Meisterwerke," p. 737, it strikingly resembles the Harmodios by Kritios and Nesiotes. Indeed, all the sculptors of those Parian marble sarkophagi in which the rich Phœnicians of the fifth century B.C. were wont to have themselves buried, were *Nesiotai*, men of the islands, Parian masters *par excellence*.

The third part contains a series of five remarkable terminal heads from Athens or the Peiræus, original works from the period shortly before and after the middle of the fifth century B.C., precisely, therefore, from that highly interesting period from which so few originals have survived. The five heads are by different artists, each of whom had his own individuality; a distinction can also be made between the earlier and the later heads. Two are still fairly archaic; two come close to the free style of Pheidias (pl. 13, 14), and one (pl. 15), the most careful in execution, and most remarkable of all, seems to me influenced by the Argive art of the epoch preceding Polykleitos. All five heads represent dignified, bearded divinities. Only one of these can be named with certainty, for he alone wears a distinguishing attribute — it is Hermes (pl. 12), represented with his travelling cap, as on Greek vases. True, the editor, Arndt, believes that the other heads also can be accurately identified, and he attempts to do so in a long disquisition. But herein the editor shows himself somewhat behind his times. In a manner which is now, fortunately, out of date, he surrenders to the naïve illusion that we can name ancient divinities on the ground of the subjective impression roused by this or that facial form, on the ground of a popular but non-historic presentment of the nature of this or that Greek divinity, without seriously inquiring into the objective sense, the meaning, and the origin of that particular art-form, or into the conceptions and beliefs which really obtained in the epoch to which the work of art belongs. One of the heads, for instance (pl. 15), impresses the editor as mentally limited; he sees in it an "esprit médiocre" "inintelligence," and "stupeur;" and since he has further come to the curious conclusion that Hephaistos must have been conceived as a mentally narrow personage (the god whose cleverness and understanding ancient poetry cannot sufficiently praise!), he feels himself entitled to call that god Hephaistos. The other names are found on the same method, and are equally valueless, for that supposed mental narrowness is merely the result of certain stylistic habits of the artist. The heads on pl. 13, 14, 15 might, as they probably do, all represent the same personage—a dignified, bearded god or hero; more we cannot say, seeing the numberless possibilities that crowd upon us in such a case. The differences between the heads, however, are those of style, and of artistic individuality, and these are of supreme interest to us, although the editor does not touch upon them. But if Arndt in this case thus abandons historical thought and understanding for deductions from arbitrary, subjective fancies, he is here following the lead of Heinrich Brunn, who in his essays upon the Greek ideals of the gods is not free from the same failing. For this reason Brunn's essays must perforce be looked upon nowa days as in great measure false, however admirable and brilliant they may be owing to the author's genial and profound understanding of the finest forms of Greek ideal heads.

The Glyptothek of Ny Carlsberg contains still a crowd of important monuments, which will appear in subsequent *livraisons* of the great work. The publication will bear striking witness to what may be accomplished, even in our day, by an intelligent and appreciative collector of ancient sculpture. Side by side with well-known works such as the Anakreon from the Villa Borghese, which I conjecture to be copied from a Pheidian original, or the Hera from the same villa, which apparently goes back to Alkamenes, the forthcoming numbers will contain many still unknown sculptures of great historical and artistic interest.

The text, likewise, in spite of a few weaknesses which we felt bound to mention, has its special strength in the wide knowledge of ancient sculpture commanded by the editor. In a manner peculiarly serviceable to students he illustrates the text with less well-known monuments bearing upon those of the collection.

We here take our leave of the Glyptothek at Ny Carlsberg with feelings of gratitude towards the founder, who not only makes his collection accessible by every means in his power, but who has already made arrangements by which to secure the gallery for all time to his native city Kopenhagen. We can only hope that Roman princes and English lords may soon follow the truly noble example set them by a simple burgess.

ADOLF FURTWÄNGLER.

* The full title runs: "La Glyptothèque de Ny Carlsberg, fondeé par Carl Jacobsen. Les Monuments Antiques, Choix et texte de Paul Arndt." Munich, Verlaganstalt für Kunst und Wissenschaft, Ancienne Maison Fr. Bruckmann, 1896. Up to December of this year three parts (*livraisons*) have appeared, each containing ten plates. The whole work is calculated to consist of twenty-two parts. The Greek and Roman portraits, although an important part of the collection (it is the most valuable gallery of ancient portraiture in existence) will be omitted from this large publication, since they are appearing separately in another work by Arndt and Bruckmann which is exclusively devoted to portraits.

ELECTRICITY DIRECT FROM COAL.

IN recent years there have been two favourite scientific subjects for writers of magazine articles, namely, how to get light without heat, and how to get electricity direct from coal. Considerable progress has been made towards a satisfactory solution of the first of these problems, and the second, according to an article by Dr. Jacques which appeared in the Christmas number of *Harper's Magazine*, has now been solved. It is more than a year ago since Dr. William W. Jacques, of Boston, invented his so-called carbon battery, and although electricians, deceived so often, at first ridiculed it, they are beginning to admit that it is a novel and meritorious invention. The inventor's account of it, therefore, even though written in a Christmas magazine, is deserving serious consideration.

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The battery consists of an iron pot which forms the negative pole, and contains molten potash at a temperature of between 400 and 500 deg. Centigrade. In this is put a rod of carbon with an iron hook suspender, which forms the positive pole, and air is kept bubbling up round this carbon by means of an iron pipe with a rose at the end, through which air is forced by means of an air pump. The potash is kept at its high temperature by means of a fire below the pot, and when the air pump is working it is found that although the electromotive force between the terminals is only a little greater than one volt, yet the resistance of the battery is so small that currents of enormous intensity can be got from it.

The results of a test made of this battery by independent experts show that between 30 and 40 per cent. of the electricity theoretically obtainable from a pound of coal can be got by this method even when the capacity of the battery is only two horse-power. Remembering that the best steam engines give only 5 or 6 per cent. of the theoretical energy, it will be seen how important this result is. Hence an account of this battery by the inventor deserves careful attention to see what are the weak points in this method of obtaining electricity.

Dr. Jacques begins by pointing out the waste of energy in our present methods of generating electricity by combined steam engines and dynamos, and this, of course, is common knowledge. He then gives a slight sketch of the various unsuccessful ways by which he tried to get electricity from natural forces without the intervention of machinery. Amongst others, he tried getting large currents from thermopiles which turn heat directly into electricity. Theoretical considerations induced him to drop this method, as he proved to himself that their efficiency must always be very small. This statement is not correct, for a thermopile which has a difference of temperature between its junctions of 400 deg. Centigrade could easily have an efficiency of 50 per cent. It appears, therefore, that Dr. Jacques is strongly prejudiced against theories of thermo-electric action, and wishes to persuade people that it is impossible to obtain high efficiencies by their means.

Then comes a description of a very feeble attempt to follow what he calls nature's plan, and get electrical energy from artificial thunderstorms. He finishes up the biographical opening with a poetical description of how one day he surprised nature's secret and found out how to convert the stored up energy of coal directly into electricity.

His first successful experiment was to suspend a piece of coal about the size of a nut in a platinum crucible full of melted potash. Into the potash a stream of cold air was blown by means of a platinum pipe. A wire attached to the coal formed the positive pole, and the platinum crucible the negative, and the current developed was sufficient to run a small motor. The inventor says that the current is *undoubtedly* due to the combination of oxygen in the air with the carbon. We cannot, however, admit the "undoubtedly." The inventor naturally hopes that it is due to this, but he has given us no proof, and personally we prefer the theory of thermo-electric action.

Dr. Jacques then describes the difficulties he encountered in repeating his experiment on a large scale. Platinum, on account of its cost, was out of the question, so he tried various metals. We wonder how many minutes some of these metals withstood the molten potash. Only one ignorant of chemistry would have tried zinc, tin, and aluminium. Iron, when he first tried it, did not answer, because "most specimens of iron have an oily surface, which, when heated, becomes converted into carbon." This, we are afraid, is nonsense, as we fail to see why a very small quantity of carbon on the anode, which is not acted on, could have any effect on the working of the battery.

We now come to perhaps the weakest point in the whole article, which is contained in the following statement:

"It has been found best to crush the coal and mould it into large sticks of convenient size to handle, and bake them to drive off the included gases and give them good electrical conductivity."

So that it is not electricity from coal, but from purified carbon baked in a furnace. What included gases are driven off is left to the imagination of the reader. Then comes a test made by two experts upon a two horse-power electrolytic generator, in which it is found that the electricity generated is 32 per cent. of that theoretically obtainable from the coal (?) consumed. Apparently the coal consumed in baking the carbon is left out of account. The "efficiency" of new inventions is one thing, the "economy" is quite another, and it is the latter that is important commercially.

We strongly suspect that there must be some fatal practical defect about the method. It has been before the public for nearly a year, and yet no mention is made in the article of the first cost or maintenance. The potash must rapidly become contaminated with the ash of the carbon sticks; how is it cleansed? Again, each cell, having only a very low voltage, must be coupled up by huge copper cables, and joints must be very carefully made. It is not proved that it is a galvanic battery consuming carbon and may be merely a thermo-electric generator, which is a class of apparatus notoriously unpractical.

Dr. Jacques ends his article by pointing out the great boon cheap power would be to humanity, and we cordially agree with what he says. His invention is a very meritorious one from a scientific point of view, and he has written a most interesting magazine article on it.

NOTES.

Dangers of Peat Bogs. ON the 28th ult. another of those terrible calamities which so frequently overtake those who dwell in the neighbourhood of Irish peat bogs took place. The scene of the disaster was the vicinity of Rathmore, a poor and thinly-populated district some twenty miles to the east of Killarney, and on the confines of county Cork. A foreman quarryman and his family were overwhelmed by the black mud, but no other loss of life is reported. At the same time large tracts of land have been destroyed so far as agricultural purposes are concerned, and quarrying operations have been suspended not only on account of roads being rendered impassable, but because the workings are now filled with peat slime, whilst the bog is still moving and seems likely to do more mischief. The daily papers allude to the occurrence as a landslip, but, of course, it is nothing of the kind — at least in the technical sense. Such great bogs as we have in Great Britain have been largely made up by mosses, especially species of *Sphagnum*, which, growing on hill tops, slopes, and valley bottoms, as a wet, spongy, fibrous mass, die in their lower parts, and send out new fibres above. Where ponds and small lakes are gradually converted into bogs, the marshy vegetation advances from the shores, and sometimes forms a matted, treacherous, green surface, the lower portions being water-logged, beneath which the waters of the lake sometimes still lie. The decayed vegetable matter from the under part of this crust sinks to the bottom of the water, forming there a fine peaty mud, which slowly grows upwards. Or a thick bed of moss, decayed in its lower parts and being of a spongy nature, absorbs much water. Heavy rains, by augmenting the watery layer, or by over-filling the bladder-like spongy mass, sometimes make the centre swell up until the matted skin of moss bursts and a deluge of black mud pours into the surrounding country. This is what has happened in regard to the recent bog-slide near Killarney. Can nothing be done to prevent such occurrences? Many of the bogs are roughly drained, and a better system of drainage would, no doubt, go a long way to mitigate the evil, but from the agricultural point of view it would not pay, and that is the *crux* of the whole matter.

Open Spaces and the Queen's Reign. THE suggestions for commemorating the sixtieth year of the reign of the Queen have been added to by an influential proposal that the dedication of open spaces in different localities, the purchasing for the public of historical ruins, and so forth, would be a desirable measure. We do not know that an open space is the best kind of memorial of anything, but any excuse for securing open spaces in perpetuity ought to be welcome. The Corporation of London never did better work than when they secured Burnham Beeches and Epping Forest for the public for ever. Why should not Kensington make a collective effort and purchase Holland House and its park? We give this as an example of the way in which the proposal which has been put forward may be carried out. In every neighbourhood those who are acquainted with it may call to mind some piece of land or some building which it is desirable to obtain and to keep as a public possession, free from all dangers of the future.

Public Works in Germany. As usual, the Budget for the German Empire (which, by the way, should not be confused with the Budgets of the Kingdom of Prussia or other minor kingdoms of Germany), contains very large proposals for expenditure on buildings, the total amounting to about 2,300,000*l*. The greatest outlay, as usual, is for military work—approximately 1,200,000*l*. The State Railways require 400,000*l*, whilst the General Post Office and the Naval Departments each show totals of approximately 250,000*l*. The estimates do not show the same interesting features as was the case some years back when the Imperial Houses of Parliament, the Imperial Law Courts, and other great national works were in hand, and it should, of course, also be remembered that, in many instances, the items shown are only votes on account; there are to be some new Infantry Barracks, for instance,

at a cost of 150,000*l.*, of which only 50,000*l.* will be voted at present. Among the items in the Naval Estimates we notice a second vote for 50,000*l.* to be expended on some new docks at Kiel, which will require a total outlay of over 400,000*l.* The General Post Office appears to continue erecting its own buildings in every important town, as in England; but some of them at all events are better buildings than our Office of Works turns out.

Lord Penrhyn and his Quarrymen.

THE Board of Trade has not been so successful in mediation between Lord Penrhyn and his quarrymen as it was in the recent dispute between the London and North-Western Railway and its employees. It appears that on September 30 the Welsh workmen applied to the Board of Trade to take action under the Conciliation Act, 1896, and the application was acceded to by the Department. The President of the Board of Trade and Mr. Young, Lord Penrhyn's manager, appear to have had an informal interview early in December, and arrived at a "verbal understanding." Thus far everything had gone satisfactorily if slowly, but on December 9 Lord Penrhyn himself wrote to the Board of Trade a letter harsh in tone and apparently contrary to the terms arranged between Mr. Young and Mr. Ritchie, since the former had agreed, it would appear, that Lord Penrhyn should receive a deputation from his men if one were appointed. The result is that matters have come to a deadlock, entirely, it would seem from the recently published correspondence, through the irreconcilable position taken up by Lord Penrhyn. It is obvious—we say nothing in regard to the merits of the dispute—that the owner of the quarries should have met the deputation from the men, and should have allowed a representative of the Board of Trade to be present at the interview, as was desired by the men. Lord Penrhyn has put himself in the wrong in this respect, and has shown once again that there are some employers who appear to act without tact or reasonableness.

Sanitary Authorities and their Workmen.

IT is very rare for the Court of Appeal to grant a new trial of a case. But they have done so in the action of Digby *v.* The East Ham Urban District Council which was tried before Mr. Justice Cave and a special jury last October. The action arose out of the death of one of the defendants' workmen, who was suffocated by poisonous gases as he was descending a manhole in a sewer. Mr. Justice Cave at the trial non-suited the plaintiff (the widow of the workman) on the ground that there was no evidence of negligence because the plaintiff had not shown that any Sanitary Authority adopted the precautions which it was suggested should have been taken by the defendants, such as testing the air of the manhole before workmen were allowed to descend into the sewer. In a note upon the case we pointed out that the result of the trial was unsatisfactory, since, according to the judge's ruling, a Sanitary Authority could not be considered negligent for not taking a perfectly reasonable precaution, if other and similar Authorities had not previously done so. The circumstances of the case must be considered without reference to the conduct of other people. When the case comes on again for a new trial, we hope that the judge will leave it fairly to the jury to say whether or not the Sanitary Authority took reasonable precautions for the safety of their workmen. If they did not, then they must pay damages, and their misconduct will be a warning to others.

Peterborough Cathedral.

IT appears that a "Remonstrance" is in course of signature in regard to Peterborough Cathedral to the following effect:—

"We, the undersigned, wish to express our sorrow at the proposal to rebuild a portion of the west front of Peterborough Cathedral, the beauty and value of which it is impossible to over-estimate. We earnestly hope that the Dean and Chapter will see their way to reconsidering their decision."

To this are appended a number of names of persons mostly more or less distinguished in Art, science or literature, but not a single one of whom probably knows anything about building construction, or has any special right to form or express an opinion on the subject. The question is one of practical structure simply; the Dean and Chapter do not want to move a stone of the front if it were not structurally necessary; they have the advice of one of the first and most practical architects of the day, who thinks the partial reconstruction necessary: on what ground are they to listen to a party of ladies and gentlemen who know nothing about the practical side of the subject, and who announce that the beauty of the front of Peterborough "can hardly be over-estimated," as if that were a special discovery of their own, and no one else were conscious of it?

The New Gallery Exhibition.

THE exhibition of Mr. Watts's pictures at the New Gallery is not only a very fine one itself, but some additional interest is given to it by the painter's own preface to the catalogue, in which he imparts to us some of his own thoughts as to the aim and purpose of his pictures. The conventional preface to a catalogue, to which we are so constantly subjected now, is an addition we could generally very well spare; but the artist's own preface is a different matter. We defer any detailed notice of the exhibition, however, because we propose to consider it next week in connexion with the collection of Leighton's works at Burlington House. The collected works of two artists who were both idealists, yet with such very different ideals, must gain an additional interest when considered in relation to each other.

East Pediment of the Parthenon.

IN his "Intermezzi" Dr. Furtwängler publishes a paper on the "East Pediment of the Parthenon," in which he claims to have discovered the original central figure of the composition. Dr. Furtwängler, with many other archæologists, had gradually arrived at the conviction that the central place on the pediment was occupied by a full-length figure of the goddess Athene dominating the whole. This figure he claims to have rediscovered in the well-known torso of Athene, known as the Minerva Medici, in the Ecole des Beaux Arts at Paris. In his "Meisterwerke" Dr. Furtwängler pronounced this statue to be a marble copy from a bronze original. On a closer inspection he believed it to be an original Athenian work of Pentelic marble, and closely allied to the Parthenon figures in general conception and the technique of details. From the rough condition of certain parts, and from the general pose of the figure, it seems likely that, as Karl Bötticher long ago conjectured, it was intended as a pediment figure to be seen at a high elevation and from a distance. M. Bulle has also pointed out that the dowel marks in the plinth are just such as are used for the attachment of pediment figures. Dr. Sauer, in his examination of the pediment marks of the Parthenon, had arrived at the conclusion that a certain central ridge in the east pediment (a Randbank) precluded the possibility of a single central figure. Dr. Furtwängler thinks this can be otherwise explained. It will be interesting to see what Dr. Sauer has to say. A further difficulty is that the plinth of the torso shows clear traces of dowel marks. The front of the east pediment shows no corresponding marks. Dr. Furtwängler explains this by a theory that the figure was carried off to Rome, and there used to decorate some temple pediment, and the dowelling marks made at that time. The whole theory is an interesting one: and whether the actual Athene is now found or not, we believe that a figure of the goddess did dominate the east pediment, thereby marking the temple as her own. The "Intermezzi" contains several other papers of great interest. A beautiful bronze head of Apollo from the Chatsworth collection is published, and its recognition is due to the acute eye of the Duke's new librarian, Professor Strong.

Ancient Greek Roads.

THE number of ancient Greek roadways that have been recently discovered is distinctly noticeable. The course and structure of the old Panathenaic Way at Athens is now known in detail, and the same may be said of a considerable portion of the Sacred Way at Delphi. During the autumn months two other important roads have been laid bare: one by the Americans at Corinth, noticeable from the fact that it has a paved footpath at each side; the other road discovered is the road that led from the Dipylon Gate to the Academy. This was, of course, one of the most important roads from Athens; its direction has been much disputed, and turns out to be somewhat different to what had been conjectured. Along this road lie, as is well known, some of the most important public grave monuments of Athens. Long ago, Dr. Schliemann tried to find the tomb of Perikles, but prohibitive prices were asked for the land. Let us hope that the Greek Archæological Society now at work may be more successful.

Decorative Work in Paris "Mairies."

THE General Council of the Seine, on the suggestion of M. R. Brown ("Inspecteur-en-Chef des Beaux-Arts") has voted money for some new decorative work on buildings in the suburban district of Paris. M. E. Michel Lançon and M. Ferry have been commissioned to decorate the new Mairie of Suresnes, one of the most graceful buildings in the environs of Paris, of which we published an illustration some time since. M. Lançon is to execute three large ceiling-paintings in the Council-room, and M. Ferry is to paint two landscapes with figures on the grand staircase. M. Eugène Simas is commissioned to paint a large decorative landscape in the Mairie at Créteil. M. Hercule, a sculptor who has produced some excellent

work, is to execute a marble bust of "The Republic" for the Mairie of Maisons-Alfort; and four decorative vases in bronze, after an ancient model in the possession of the Paris municipality, are to be erected at Clichy-la-Garenne, in a large square recently completed in the centre of that Commune. In commissioning landscape subjects, which are not in a general sense the most suitable for decorative painting, for the suburban Mairies, the General Council aimed both at securing some variation from the constant succession of allegorical subjects in decoration, and also at making some of these paintings a topographical record of the original aspect of the neighbourhoods concerned, which are constantly undergoing change from year to year.

John Hunter's House in Leicester-square.

WE understand that the proprietors of the Alhambra Theatre are about to extend their premises by rebuilding No. 28, Leicester-square, and the house at the rear in Castle-street. In 1768 John Hunter moved from Golden-square into a house in Jermyn-street in succession to his brother, William. Upon the expiration of the lease, 1783, he purchased a twenty-four years' lease of No. 28, Leicester-square and what was then No. 13, Castle-street, with the ground abutting upon Leicester-court, entered from Castle-street, between the two. On that ground he erected, at a cost of 3,000*l.*, a large museum for his collections, and lecture and dissection rooms. The museum, latterly used as a workshop, rises through two stories, with a wide gallery midway, and is lighted by three cupolas in the roof. A plan of the two houses, museum, &c., drawn by his assistant and curator, William Clift, we have seen in the collection of papers and drawings deposited by Sir Richard Owen's executors in the Royal College of Surgeons. At Leicester-square, Hunter (like Sir Joseph Banks in Soho-square) held his Sunday evening receptions, gave courses of lectures, set up a printing press and book-warehouse, and, in 1785, instituted with Dr. Fordyce the Lyceum Medicum Londiniense. Hunter died in 1793, and was buried in St. Martin's-in-the-Fields. His remains, found after a long search in the vaults (1859) by Dr. Frank Buckland, were re-interred by the College of Surgeons, near Ben Jonson's grave in the north aisle, Westminster Abbey. His pictures, drawings, and library were sold "by Mr. Christie, at his Great Room in Pall Mall," January and February, 1794. In the auctioneer's catalogue (Stone Collection) of the sale of his household effects, including a set of painted hangings by Zucarelli, on September 24, 1806, the house is described as "his residence, No. 28, on the east side of Leicester-square"; yet it appears that it had been previously known as No. 12, Leicester-fields. The materials of the house he built at Earl's Court, Kensington, in 1763, were sold at auction, February, 1886, when the ground, two acres, was taken for Barkston-gardens.

New System of Railway Signalling.

THE electrical system of railway signalling, invented by Mr. W. S. Boult, which is now being tested in daily working on the Manchester, Sheffield, and Lincolnshire Railway near Dinting Station, promises to be of great importance. Although many electrical systems of communicating with trains in motion have been devised, few of them can be de-

Brass of Sir Nicholas Hawberk (A.D 1407), in Cobham Church, Kent. From a rubbing by Mr. C. W. B. Bryason.

pended upon in actual work. The weak point about most of them is the mechanical method adopted of making electrical contact with the train. No mechanical method can be absolutely relied on in all weathers and in all conditions of the line. Mr. Boult's system is a very simple one, an electro-magnet on the road actuating two needles in a box below the engine, and each of them completing a circuit works two miniature semaphores in front of the driver and at the same time rings a bell. The use of two contact-making needles is to avoid all risk of a danger-signal failing to be received.* The signalman is thus enabled to have direct communication with the driver and guard even when the train is at full speed. If this system stand the test of further experience, it will make semaphores and coloured lamps superfluous, and do away with the present barbarous system of fog signalling.

Theft of Electrical Current.

WE observe from a notice in the *Centralblatt der Bauverwaltung* that the Supreme Court at Leipzig has refused to endorse the verdict of a lower Court punishing the theft of electrical current, owing to the laws of the country having restricted the punishment for theft to "tangible objects," whilst an electrical current cannot be considered as such. The decision of the Supreme Court no doubt exhibits the legal mind in its most conscientious and strictly logical aspect. Whether the verdict is equally in accordance with justice and common-sense is another question.

BRASS OF SIR NICHOLAS HAWBERK (A.D. 1407), COBHAM, KENT.

THE brass here illustrated lies in the chancel of Cobham Church, Kent, in commemoration of Sir Nicholas Hawberk, the third husband of Lady Joan de Cobham, who was his second wife. This is considered the finest military brass of the period.

The figure is surmounted by a handsome triple canopy, containing in the centre the Holy Trinity, on the right the Blessed Virgin and Child, and on the left St. George and the Dragon. Sir Nicholas Hawberk's head rests on his tilting helmet as a cushion, a common occurrence in monuments of all description. This helmet is crested with a fish in a circle. At the foot, on a pedestal, stands the figure of his son, John.

Sir Nicholas died at Cowling Castle on October 9, 1407.

Surrounding the brass is the following inscription, written in Latin:—

"Here lies Sir Nicholas Hawberk, Soldier, formerly husband of the Lady Joan de Cobham, heiress of Sir John de Cobham, founder of this College, which Nicholas died at the Camp of Cowling on the 9th day of October, 1407, on whose soul God have mercy, Amen."

C. W. B. B.

THE LONDON COUNTY COUNCIL INQUIRY.

THE Special Committee of the London County Council, appointed to inquire into the organisation of the Works Department,† met again on the 23rd ult., at Spring-gardens, when the Chairman of the Council, Sir Arthur Arnold, presided.

Before the examination of Mr. Blashill, the Architect to the Council, was resumed, two documents were put in, one containing a statement by the Assistant Solicitor, showing the clauses added to the old Metropolitan Board of Works' form of contract, by the London County Council, and the other a report by Mr. C. J. Stewart, Clerk of the Council. The new form of contract besides prohibiting the contractor from underletting, requires him to pay the Trades Union rates of wages, and to observe the hours of labour and conditions recognised by the Trades Unions. Mr. Stewart's report deals historically with the Works Department from its formation and the appointment of a Manager in January, 1893.

Up to March, 1893, the Council entrusted all works for general repairs to contractors, London being divided for this purpose into four districts, and the work was carried out under schedules of prices which were prepared by the Engineer and the Architect respectively; tenders were obtained for a fixed period on the schedules referred to, and the contractors were asked to state in their tenders at what percentage above or below they were prepared to carry out the work. After that date jobbing works were carried out by the Works and Stores Committee; a clause being added in October, 1895, exempting jobs of the estimated value of less than 5*l.* when they had to be carried out at a distance of more than three miles from the central works, and another added in 1896 giving the option to the Fire Brigade Committee to get executed, either by contractors or by the Works Department, any jobbing work required at Fire Brigade stations. If the Works Committee was satisfied as to the sufficiency of the estimate it proceeded with the work at once, and if the estimate was deemed insufficient, a report to that effect was made to the Council, and the estimate was then referred back, for revision, to the originating Committee. There had been two cases in which works had been refused by the Works Committee, and, tenders having been invited and found to be in excess of the estimate, they had been referred to the Committee on a revised estimate. These works, which are still unfinished, are (1) alterations to Pimlico Riverstation, and (2) paving work at Mill-lane, Deptford. On the Pimlico estimate of 700*l.* the only tender received was 1,171*l.* This estimate, on being revised to 950*l.*, was accepted by the Committee. For the paving at Deptford the tender received was 1,988*l.*, the original estimate 1,854*l.*, and the revised estimate accepted by the Committee 1,968*l.* Statistical tables appended to the report show that the total cost of works supervised by the Architect was 232,212*l.* upon final estimates amounting in the aggregate to 224,417*l.* The jobbing works executed by the Committee on a schedule of prices show an actual cost of 27,410*l.* upon a scheduled value of 29,372*l.*, showing a profit of 1,962*l.*

The examination of the Architect was resumed by Dr. Longstaff, who brought out the point that the objections to important works being carried out by the Committee were not so great in the case of engineering contracts as in that of architectural contracts, on account of the much greater complexity of the latter than the former. In illustration of this, Mr. Blashill stated that in the contract for Blackwall Tunnel, an engineering work which cost 800,000*l.*, there were only 935 items, while in the contract for a Weights and Measures station, an architectural work costing but little over 6,000*l.*, there were 2,175 items, or at the rate of 150 items to 1, in proportion to cost. Dr. Longstaff (recurring to the extraordinary bill of charges for repairs to a lamp at Blackheath, at a cost of sixty-eight shillings, when the estimate was only eleven shillings) asked: What could the carpenter have to do with repairs to a lamp? Does not this look like another "bogus transfer?"

Mr. Blashill: I should not like to say that. It might have been so. The witness added that he should have thought it only a case of waste of time by workmen had these been merely excessive in number; but when men who could not have been employed on the job were charged, he owned that it looked like another case of transfer. Other cases of extraordinary bills of costs having been elicited, Mr. Blashill said the quantity of the work done by direct labour of the jobbing class was satisfactory, but not the cost. Questioned on the allegation of carelessness of some of the workmen of the Works Department, the Architect instanced a 6-in. drain 160 ft. in length where the cement had not been properly wiped from the inside at the joints. This defect, which was only discovered by a fortunate accident, was a serious one, which would eventually have stopped up the drain, and would have caused considerable expense if it had not been discovered at once. With respect to the charges made against members of the Works Committee of interference, and consequent insubordination on the part of the workmen, the witness said he had heard of such interference, but it was only hearsay and not evidence. With regard to getting the proper amount of work out of the men, he said he did not see why, with proper supervision, the same work should not be done for the Department as for a contractor. The complaints were not against materials, as a rule.

Mr. Beachcroft: Is it the fact that needlessly superior materials are used, and that the supervision is needlessly stringent?—No. In answer to further questions from Mr. Beachcroft, the witness said the Department tried to get materials as cheaply as possible in order to complete their jobs within the estimate, and that delays had taken place in consequence of the search after cheap materials. He thought it impracticable for the Department to tender, and it was not necessary. Even if the Works Committee were continued, it would always be advisable to get tenders from contractors. He believed the Admiralty and the Ordnance Department did so, and thus got a good test whether they were being well served by contractors. With regard to extras, he must say, in justice to the Department, that it was very solicitous to have his opinions. He made no complaint of the Department for not letting him see their estimates. The Committee was friendly—at arm's length. With regard to work done at New Cross on an estimate of 16,000*l.*, which was higher than any of the seven tenders sent in, the Architect said he did not want to criticise the acts of the Council; besides, one of the good tenders was as high as 14,587*l.*

Mr. Beachcroft: Can you account for the remarkable disparity in tendering? Yesterday, for example, we had some tenders on work estimated by you to cost 100*l.*, the lowest of which was 71*l.* 5*s.* 3*d.*, but one was as high as 1,500*l.*!—They always found tenderers who did not know how to estimate, and some would send in a tender merely in order to get back the deposit money paid on obtaining the bills of quantities. Sometimes a high tender would be sent in by a contractor who wanted to get his name before the Council, but did not want the job. If from a number of tenders they took off two or three of the lowest and two or three of the highest, they would usually get very good average tenders. In reply to a question whether he would like to put the manager in the same position as the contractor, Mr. Blashill said: No; he only proposed that he should be like himself. He would be in the same way as other officers, responsible to, and controlled by various spending committees. Questioned with regard to the advantage derivable by the ratepayers from the direct employment of labour by the Department, the Architect expressed his opinion that the financial result would not be great. They might get certain kinds of work done more cheaply, but with regard to works generally if it were left to him he should think it better, if there was no other disadvantage, to deal with one set of persons rather than with twenty sets of persons. He thought none but economical reasons should be considered in employing workmen. The employment of labour for the good of the labourer was not to be considered.

Replying to Mr. Davies, the witness said he did not know that lack of technical knowledge made the work done by the Department cost more. Want of proper supervision was the reason why certain works were too costly. With regard to his method of estimating, Mr. Blashill said he went on the ordinary lines of the architect.

Mr. Davies: Do you consider that the abolition of the Department would make any difference to the rate of wages in London?—No.

The witness, in answer to questions, gave further explanations with regard to the bad wood used for doors, iron, used at a fire brigade station, which did not stand the test, and the 60 tons of spent lime used as sand.

In reply to Mr. Torrance, the witness said that the work done by the Works Department had been well done, as a rule. They might carry out a number of works better and more cheaply than contractors, but there had been no great economy. The whole thing was still in the experimental stage, though a number of difficulties had been surmounted. He believed that ultimately the Council would attract superior workmen to its service.

Responding to Mr. Fletcher, the witness repeated his former statement that he had not been more severe against the Works Department than against contractors, nor *vice versâ*, except where it was necessary to consider the interests of the spending Committees. When he made the Works Department do work over again, his spending Committees had to suffer, and sometimes it became a question whether he should insist.

Replying to a suggestion to try as an experiment tendering by the Committee, he said he was averse to trying experiments where the pro-

* If one of the needles fail, a fault indicator at once points it out to the driver without interfering with the working of the other needle.

† For reports of previous sittings see our issues for December 19 and 26.

bability was that they would fail. It would certainly be a disadvantage to the Council if contractors refused to tender. He had heard of workmen in the suburbs complaining that they could not get work from the Council. Those complaints would continue so long as the work was given out from one central place.

Dr. Collins, referring to a statement made some time ago by Sir John Lubbock, on the authority of the Architect, asked whether variations of the method of preparing the estimates took place from time to time? Mr. Blashill, in reply, said that for a long time the practice had been uniform, and that since 1893 a more scientific method had been adopted, four quantity surveyors, who were architects, being employed for the purpose. Since 1892 the profit had been lower on account of strikes, and the rise in prices. The recent tables of statistics presented were nearer the mark.

The inquiry will be resumed on Wednesday, January 13th, when it is expected that the Comptroller will be examined.

ENGINEERING SOCIETIES.

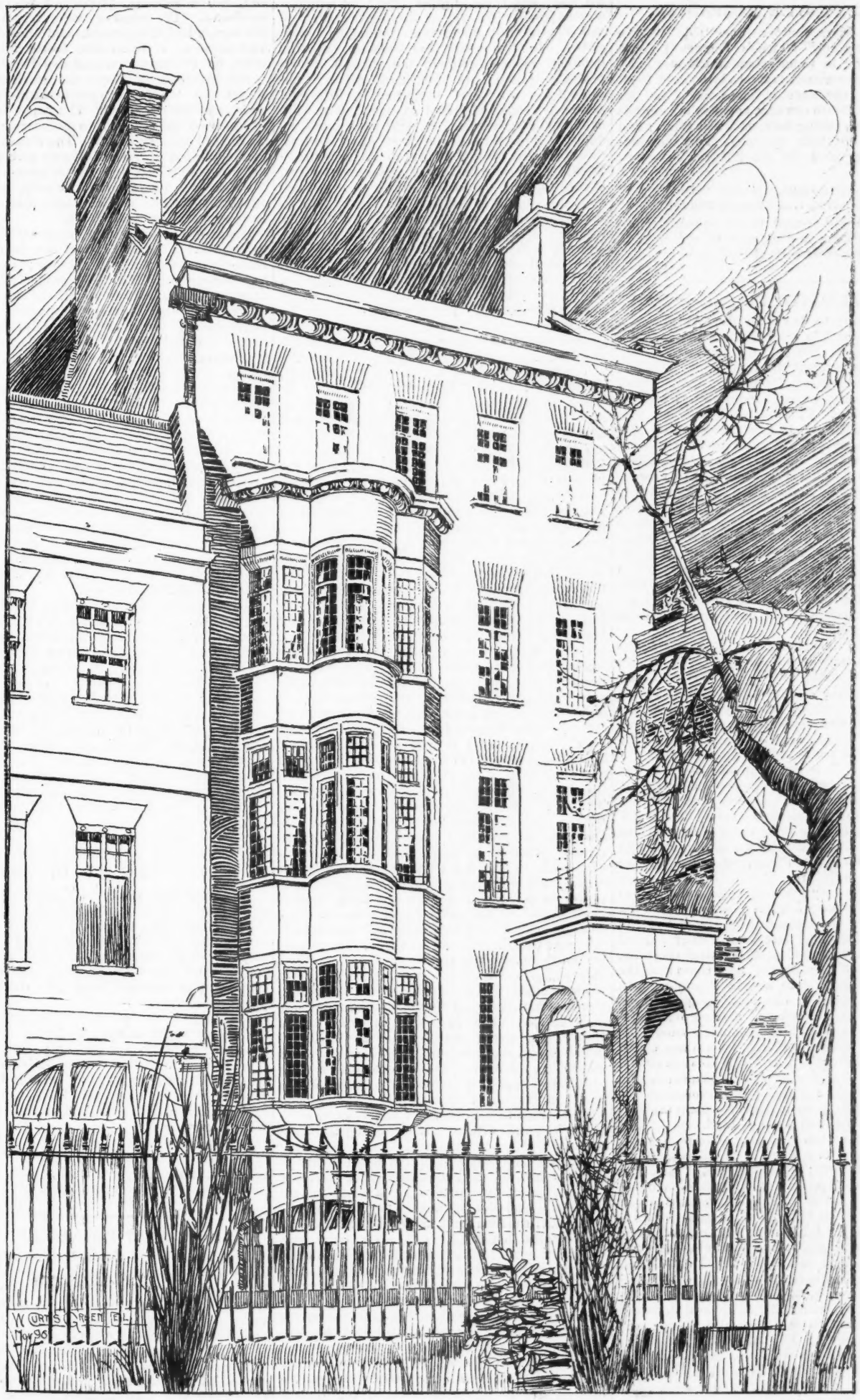
INSTITUTION OF CIVIL ENGINEERS.—At the ordinary meeting of this Institution, on the 22nd ult., Mr. John Wolfe Barry, C.B., F.R.S., the President, in the chair, the paper read was on "Steel Skeleton Construction in Chicago," by Mr. E. C. Shankland, M.Inst.C.E. The congested area of the main commercial district of Chicago, confined as it was by the lake, river, and railways, had brought about the erection of high buildings. The compressible nature of the soil, however, had made it necessary to build thin walls, carried on a steel frame, with isolated footings, spread so as not to exceed the safe pressure on the clay, namely, about 3,500 lbs. per square foot. After a brief historical account of the earliest high buildings, a description was given of the mode of designing the steel frame, the disposition of the columns, and the framing plans of the roof, attic, and each floor being respectively dealt with. In a typical case, the Fisher Building, eighteen stories high, the live load, made up to the weight of the tenants, the furniture and the partitions, which were constantly being changed, was taken at between 60 lbs. and 75 lbs. per square foot for the upper floors, and from 75 lbs. to 100 lbs. per square foot for the first and second floors, which were generally used for shops and banks. The weight of the tenants and furniture of a typical office was found by experiment to be only 6 lbs. or 7 lbs. per square foot. The average weight of the partitions was 25 lbs. per square foot. Having ascertained the live and dead floor-weights, the weights of the outside walls, the lift-loads, the weights of the lift and house-tanks, and of the water-closet floors, window-panes, glass, mullions, &c., a column sheet was drawn up showing the weight supported by each column at each floor. The live load, except that for the partitions, was then deduced and the remainder was used in designing the foundations. The unit stresses commonly employed were 16,000 lbs. per square inch per fibre strain in steel H-beams, 15,000 lbs. per square inch for plate girders, and 15,000 lbs. per square inch for short columns in compression. The roof was made up of beams and girders supporting tee-bars, spaced at 18-in. centres, between which book-tiles were built. Over the book-tile was spread a layer of cement, and on this a six-ply tar and gravel roof was laid, and the beams supporting the tees were fire-proofed. The types of columns in general use were mentioned and their relative merits discussed. The steel smoke-stack had supplanted the brick chimney, special arrangements providing for expansion and contraction of the steel where the stack passed through the roof. The author's practice was to construct the frame to withstand a horizontal wind-pressure of 30 lbs. per square foot over the whole side of the building, the resulting stresses were supposed to be taken up by all the columns in each row. If the maximum stress in any column from live, dead, and wind stresses exceeded 25,000 lbs. per square inch the column was enlarged to bring the stress below this limit. The various kinds of wind bracing employed, including rods, portals, knee braces and plate girders between outside columns were illustrated, and the effectiveness of each discussed. Different portions and connexions of the steel frame, as well as the cover column connexions, spandrel sections, cornice and roof construction, bay windows and balcony construction, &c., were illustrated and described. The most recent floor arches and column fireproofing were also discussed and drawings of different methods given. It had been stated that there was no such thing as fire-proof construction if the phrase were taken in a strictly literal sense, no known substance being able to resist a change of state when subjected to intense heat; but the Chicago high buildings were absolutely fireproof in the sense that they would safely resist any fire which could occur in or around them. This had been shown by severe tests to which certain buildings had been exposed, accounts of which were given. For preserving the steel frame from rust, the best practice was to thoroughly scrape off the scale and apply a coat of oil at the mill, and a coat of red lead, graphite, or asphaltum after erection. This sufficed for the beams, but all outside columns were filled with Portland cement concrete. The steel beams used in the foundations were always embedded in Portland cement concrete, without being either oiled or painted, as the concrete adhered better to the unpainted metal. In the case of internal columns, when the fireproofing was well fixed and covered on the outside with plaster, the column was surrounded with a nearly air-tight space and the danger from corrosion was small. Spread footings formed the typical Chicago foundation. Foundations had in some cases been sunk into the hard pan so as to give greater basement height. Experience had, however, shown that it was safer never to descend below the top of the hard pan. If the borings showed any sand pockets or soft spots, the contractor was required by the specification to excavate them, and fill the cavity with concrete. A typical boring was shown, and the results of two tests, to determine the bearing capacity of the clay, were tabulated. The design of a spread footing, on the assumption of a given load per square foot to be used on the clay, was described in detail, and, as an example, a layer of beams in a large footing under the Masonic Temple was computed to show how the number and size of the beams, and their length, were determined. The reason for not using the live load in designing the footings was stated, and a prominent building was mentioned to show the bad effect of using the live load in calculating the foundations. Cantilever construction used in foundation work was described and illustrated. Pile foundations were only used under a few office buildings, and tubes, filled with concrete, were referred to as unsatisfactory. The author considered the settlement was caused by the water being squeezed out of the clay, and that it gradually diminished, and finally stopped. This was illustrated by an occurrence during the construction of the Masonic Temple, and was further shown by the settlement curves of the same building, extending over a period of four and a half years. The amount of settlement of the high buildings amounted to nearly one foot, and the footings were raised, when construction was begun, in anticipation of it. The weight of the steel frame in an office building from sixteen to twenty stories in height was very uniform, ranging between 1⅛ lbs. and 2 lbs. per cubic foot of the building. The cost was between 4·9 cents and 6 cents per cubic foot, being from one-seventh to one-ninth the cost of the building. The length of time required to completely finish a high building was between seven months and one year. The paper was also illustrated by lantern-slides, showing typical buildings in various stages of construction.

THE INSTITUTION OF JUNIOR ENGINEERS.—At the meeting of this Institution, held at the Westminster Palace Hotel on December 18, the Chairman, Mr. H. B. Vorley, presiding, a paper was read by Mr. P. W. McDougall, A.I.E.E., on "Electric Central Station Working." With reference to the choice of a suitable site for an electric light station, the author stated that it depended upon two questions—1, whether the system to be adopted be high or low pressure; 2, the relative cost between any proposed sites of obtaining the daily supplies of fuel. Low-pressure stations had to be close to the consumers, but those of high-pressure could be placed right away on inexpensive ground, and with a river frontage. This was a great advantage, not only from the fact that any quantity of water could be obtained for condensing purposes, but also on account of the facility with which sea-borne coal could be brought to the station. As to boilers, the marine type was most suitable for an electric supply station, where quick steaming was an essential quality. Electric light engines used to drive alternators should have as even a turning moment on the crank shaft as possible, so as to ensure satisfactory parallel running. The latest addition to the Deptford station of the London Electric Supply Corporation, which was designed by Mr. P. Walter d'Alton, engineer-in-chief, had this quality in a very high degree. It was a direct-coupled plant. The engine consisted of three separate compound engines with cylinders tandem fashion on a three-throw crank shaft with cranks at 120 deg. The alternator was of the Ferranti type and generated 100 ampères at 10,000 volts, at a speed of 150 revolutions per minute. The design of the armature, which was built on to the rim of a wheel 16 ft. diameter, was very open, and therefore gave plenty of ventilation and ensured cool running. The governors were either of the throttle or expansion type. The expansion governor was, perhaps, more generally the practice in electric light stations, but although the throttle governor was often considered not at all suitable for electric light engines, where steady governing and economy were such important matters, it had been adopted in some stations with very satisfactory results, especially when the engines were non-condensing. Whatever the type of governor used, it was a matter of first importance that all the governors should have as near as possible the same range of sensitiveness. If an engine had a governor which allowed a variation of 1 per cent., another of 2 per cent., then when put into parallel, the one would work against the other, and the load would not be divided evenly, and great unsteadiness of the light would result, and perhaps failure of the dynamos. Alternators could be excited either by small continuous-current dynamos driven by separate steam engines, or by ropes from the alternator shaft, or by rectified current from the alternator. The rectifier method had not proved an unqualified success, the regulation not being satisfactory, a slight variation in the speed of the engine producing a very considerable variation in the voltage of the alternator. The exciters were often a weak part of an alternating station. There should be one for each alternator, driven by ropes off the alternator shaft, and made of ample size, so that the exciting system might not need any special attention on the part of the engineer-in-charge. With regard to the mains and their insulation, paper saturated with Ozokerite (earth-wax), or resinous oil, had given very satisfactory results in high-tension work. The switching gear of a large central station was generally rather complicated, and in a high-tension station the switches had not only to be sure in their action of "breaking" the current, but great care had to be taken that they were well insulated, so that the operator was not endangered. The high-tension switches at Deptford which had been redesigned by the Company's own engineers, consisted of a long, light gun-metal arm worked by a lever of the signal-box pattern. The "break" was 4 ft. 6 in., and being high up overhead, perfect safety was assured. There had been no difficulty in "breaking" the current with the machine working at full speed, *i.e.*, 100 amps. at 10,000 volts, and also on a short circuit. Owing to certain effects due to the capacity and length of the trunk-mains from Deptford it had not been possible to put on a main or withdraw it suddenly by pulling off a plug, without producing a variation in the voltage on the system. But this had been successfully overcome by an arrangement suggested by Mr. G. W. Partridge, of the L.E.S. Company. The main was connected to the 'bus bar through a high inductive resistance, and was gradually charged to the required potential by reducing the induction. As soon as the potential on the main was equal to that of the 'bus bar, then the main plug was inserted and the discharger disconnected. The reverse operation was performed when it was necessary to withdraw the main from commission. Arc lamps supplied by Ferranti rectifiers were, perhaps, the most practicable and efficient method of lighting in alternating current systems. Very satisfactory results had been obtained in several provincial towns with street lighting carried out in this way.

SKETCHES OF LONDON STREET ARCHITECTURE.—IX.:

HOUSE IN CHEYNE-WALK, CHELSEA.

THIS is a house designed by Mr. C. R. Ashbee, and erected on the site of the old "Magpie and Stump" at Chelsea. It is built chiefly in red brick, the basement, the porch, and the cornices being in stone. The windows of the projecting bay are constructed in wood, and all the woodwork is painted white.



Sketches of London Street Architecture.—IX. House at Chelsea. Mr. C. R. Ashbee, Architect.

The cornice presents a curious example of indifference to the usual proportions of architectural detail, in the abnormally large size of the egg-and-dart ornament; but the incident is in keeping with the *naïveté* of style characteristic of the Georgian era and especially of Chelsea architecture, and the house keeps up the traditional local character, besides being picturesque in itself.

PREMISES, EDINBURGH WORKING MEN'S CLUB.—The new premises of the Edinburgh Working Men's Club and Institute in Infirmary-street were opened recently. The architect was Mr. J. Breingan.

Illustrations.

FRIEZE: "VITÆ LAMPADES."

THIS frieze, under the title "Vitæ Lampades" ("Life's Torches"), is a design in water-colour which was exhibited at the Liverpool Autumn Exhibition of 1896.

Love lights the torch of Life; Sleep and his elder brother Death confront and stay all mortals in their course, taking from each his torch; and these they forthwith quench. The idea was primarily suggested by the lines of Lucretius, bk. 2, 78:—

"Inque brevi spatio mutantur secla animantum,
Et, quasi cursores, vitaï lampada tradunt":—

the allegory being treated in its general significance, and without any attempt to reduce it to the exact terms of an ancient torch race.

J. S. B.

ALDGATE IN 1531.

DOWN nearly to our own day Aldgate was comparatively rich in mediæval remains, as it and Bishopsgate were the only portions of the City proper which escaped the catastrophe of 1666; recent "improvements," however, have cleared off almost every ancient landmark, except the two churches of St. Andrew Undershaft and St. Catherine Cree. It must be admitted that both are interesting structures and have been carefully preserved. St. Andrew's is an excellent example of a late "Perpendicular" City church, and is moreover the burial place of the great City chronicler, John Stowe. St. Catherine's was, with the exception of the tower, which dates from 1498, rebuilt by Archbishop Laud, and is, internally at any rate, a graceful example of the Gothic of his day; it contains a monument to Sir Nicholas Throckmorton, who was a man who had "the courage of his convictions," for he was a Protestant under Mary and a Catholic under Elizabeth.

In Mediæval times the glory of this neighbourhood was the magnificent Priory of Holy Trinity or "Christ Church," which was founded and most generously endowed by the Empress Matilda, who gave to the Canons-Regular not only their vast church and convent, but the whole ward of Portsoken, four parishes, and the City gate. This last seems to have proved rather "a white elephant" to the religious community, as it brought them frequently into collision with the civic authorities. It will be seen from our view that the monks were allowed to carry their buildings right across the main thoroughfare, so that the only access for the citizens was either through the courtyard of the Priory, or round by the narrow lane called the "Poor Jewry." This right over the City gate was upheld in favour of the monks by every English Sovereign until the suppression of the monastery by Henry VIII. in 1531. The buildings were shortly after handed over to Sir Robert Audley, who pulled down the greater part of the church and converted the monastic buildings into a dwelling-house. In the time of James I. the place seems to have become a kind of "rookery," and a good Alderman of London built a brick church amidst the ruins of the ancient building, which was called "St. James's, Duke's-place." Old views show that it was a Gothic edifice, of small dimensions, probably built of old materials; it was rebuilt in the eighteenth century in a perfectly plain manner, and was finally pulled down in 1878.

At the present time nothing, except a small arch at the back of a shop, is to be found of all this great monastery;* though no longer back than the year 1876 the present writer made sketches of two beautiful vaulted apartments which existed beneath a house on the site of Messrs. Moses & Sons' Aldgate establishment. One of these stood north and south, and the other east and west, in the shape of a letter L. The vaulting, and, in fact, the whole structure, was early fourteenth-century work, 14 ft. in span, and very carefully constructed, with richly moulded ribs, carved bosses, and corbels adorned with foliage and grotesque heads.† The walls had originally been pierced by large windows, so that it could not have formed a portion of a crypt; it was on the opposite side of Aldgate to the main structure of the Priory, and probably formed a portion of the Prior's house. It may here be noticed that the ground floors of the Bishop's palaces at Wells and Norwich are vaulted, but not so elaborately as this, and I am inclined to think that one of these may have been the Prior's Guest Hall; they evidently formed the angle of a courtyard, but what was their original length or height it was impossible to say, as they were walled off and filled almost up to the "springing" with earth. In the year 1851 another beautiful building existed behind the houses facing Aldgate pump. It consisted of a hall, vaulted in two spans, supported by lofty and extremely elegant clustered columns. The sides of the building were not at right angles and, no doubt, it stood between the gates which led from the courtyard of the Priory to Aldgate-street-Within and Leadenhall-street. Numerous plans, elevations, and perspective drawings by Sewell and others are to be found. The writer remembers the building well, and often saw it. The tradition in the neighbourhood was that it was formerly "the Church of St. Michael, Aldgate," but it could never have been a church, and was in all probability the refectory for poor pilgrims, which was always attached to the gates of the greater monasteries. It was only 45 ft. long by about 24 ft. wide, so that the little space of ground might have been spared for one of the most beautiful architectural remains in the city.

The principal gate of the priory, in Cree-lane, existed in 1816, and is shown in drawings by Smith, Sewell, and Schnebele; it had a large and a small arch, and was of good Early English work; one of these drawings shows picturesque old gables adjoining. Plans and elevations by Wilkinson and Schnebele, dated 1823, show the plan of part of the cloister court on the site of Duke's-place, and the building forming the western side of that structure with a great hall on the upper story, 120 ft. long by 27 ft. wide. The lower story was pierced by large irregular arches, one looking like a kind of bridge. Audley's alterations, in the latest Tudor style, can be distinguished, and there would appear to have been an external stairway leading up to the great hall, which was probably the dormitory for "externs." To the north was a gateway which led to a public passage on the site of the north walk of the cloisters, and attached to this was a fragment of the west front of the church, with an arch which was probably the head of the window at the end of the south aisle of the nave. In Aggas' view of London [certainly published after 1571*] the refectory is shown (partly in ruins) lighted by a range of Gothic windows; it was on the south side of the cloister court parallel with the church. In the so-called "view of London, by Van Wyngarde," the church is shown entire, with a great centre tower like that of St. Saviour's, Southwark, the ends of the choir and transepts flanked by large turrets. The square east end is, at first, a little puzzling, because the etchings and drawings of the ruins in Mitre-court, by Smith & Sewell, in 1802 and 1803, show a Norman chevet and radiating chapels, but probably the east end of the choir had been rebuilt square in the fifteenth century (as was the case of St. Bartholomew the Great, an almost contemporary church of the same order) leaving the old Norman chevet and eastern chapels. The church was a favourite burial place for City worthies, and the first Lord Mayor of London, Alwyn Childe, was interred here. There are numerous drawings and engravings of the ruins of this noble monastery, but hunting them up has been a work of several years, as they are in portfolios and books in several of the London museums, and some of them in a History of London in twenty-seven volumes without index, arrangement, or pagination!

The old City gate, at Aldgate, was singular in plan; it was, in fact, a double gate, the inner one possessing two archways, one leading into the Jewry, and the other into the court of the monastery, so that it may almost be said to be at right angles to the City wall. The outer gate had lofty towers, upon which were exhibited those ghastly trophies, the amputated heads and arms of those who had suffered the "extreme penalty of the law." The gate is shown fairly distinctly in Aggas, and in the old view in the Bodleian Library, wrongly attributed to Van Wyndegaerde, and incorrectly dated 1550. †

The old parish church of St. Botolph, down to the year 1754, stood just outside the gate, a little to the north, on the site of the present building; there are several views of it extant; perhaps the most reliable is one by R. West, dated 1737. It appears to have consisted of three naves of almost equal height and width, with a fine lofty tower to the south, a singular porch on the same side quite close up to the west end, and a building, probably a vestry, to the north-east. The windows were very large, but the tracery had disappeared, and the roofs were high-pitched; it looks like fourteenth century work, but the tower was probably Perpendicular.

Just inside the Wall was the small old parish church of "Saint Augustine-upon-the-Wall," with an institution called "The Papey" attached. I have been quite unable to discover any reliable drawing of these buildings. The church is, however, indicated in Aggas' view as a very diminutive structure with a low square tower, but, as it is shown in a garden quite isolated, the college attached to it had probably been pulled down at its suppression by Edward VI.

Aggas also shows a large house with numerous gables, and a garden just at the point where Bury-street joins Cree-Church-lane, and opposite to Heneage-lane. This was probably the town mansion of the Abbots of St. Edmund's-Bury, which after the Reformation passed into the possession of the Heneage family, hence the names "Bury" and "Heneage" lanes. There is, however, another street about here, the derivation of the name of which is not so easily accounted for. That is "Bevis Marks," which all historians of London tells us is a corruption of "Bury Marks," but is it in the least likely that "Bury," a word which enters into the composition of some two or more thousand names of English localities (not a few of which are in London itself), could get corrupted into "Bevis"? and, after all, what is the meaning of "Bury Marks"? It is much more likely that Bevis is simply the old English word "Beaves," and "Marks" is market, or "Mart." In other words, the place was in early times a meat market, which is extremely likely, as it is close to the town gate, just as Newgate market was.

The distant portion of our view is composed of the following places: Whitechapel, The Minories, Houndsditch, near to which will be found the walled garden and farm of Holy Trinity Priory with its "Dove's-house," and "Stronge gate." The "Dove's-house" is shown in the old Bodleian view as a very respectable tower, looking as though it might have belonged to a church. In the extreme distance the villages of Bow, Bromley, West Ham, and Hackney, are indicated by their church towers, which for the most part still exist. The churches of East Ham and West Ham, by the way, are the most interesting and probably the oldest in the whole neighbourhood of London.

H. W. B.

SKETCH FOR A CORNER OF TENNYSON'S "PALACE OF ART."

THE allegorical palace of Tennyson's poem, as most readers will remember, was built on a "huge crag-platform" (the poet adds "smooth as burnished brass," which crag-platforms never are) where the soul was to "live alone unto herself" and look down in pity, from her isolation, on the common herd who dwelt in the plains below.

The idea of this palace on the crag with its solitary occupant always fascinated me, though the present sketch of it can only be considered "as an essay in the intervals of business," having been planned and carried out between Christmas Day and Monday morning, which is short space for designing even a palace in the air and built without contractors.

It is probable that the palace in Tennyson's mind was Gothic, as he speaks of "deep-set windows, stained and traced;" but then the poem was written before the neo-Classic revival.

H. H. S.

GREAT MALVERN.*

THE monastery of Great Malvern—more correctly a priory—forms one of a group of churches formerly attached to Benedictine foundations lying within a few miles of each other in the valley of the Severn. Two of these, Gloucester and Worcester, have already appeared in our Cathedral Series, and a third—Tewkesbury—in the present series of Abbeys. A fourth—Pershore—will be illustrated and described later in the present year. Of all these monastic churches Malvern is the smallest, though not by any means less in interest. It has one point of similarity with its neighbours—that of retaining some portion of its Norman structure. Though inferior in scale to the great Norman naves of Gloucester

* The arch is said to have formed a part of the Refectory (?), but more probably it belonged to the infirmary, as it is too far east to have been part of the former building.

† Some of these are preserved in the Guildhall Museum.

* Reproductions are dated 1560, but the date is certainly incorrect. See article upon "London in the Time of Henry VIII."—*Builder* for January 7, 1888.

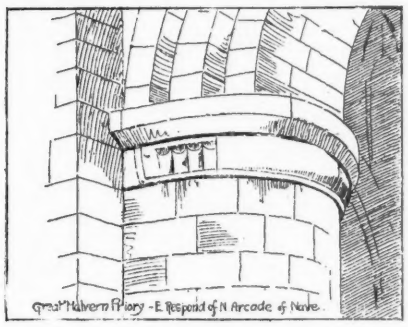
† The reasons for believing this view to date from the year 1522 are given at length in the article in the *Builder*, January 7, 1888.

* The series of the "Abbeys of Great Britain" is continued this month with illustrations of "Great Malvern." The next of the series (Sherborne) will appear in the number to be published on April 3, 1897.

and Tewkesbury, it bears evidence of being the work of the same period. Later work—of the Perpendicular period—has, as regards the exterior, obliterated nearly all traces of the earlier work, and the apparently late character of the exterior causes something akin to surprise when the comparatively low and simple treatment of the nave arcade is seen on entering.

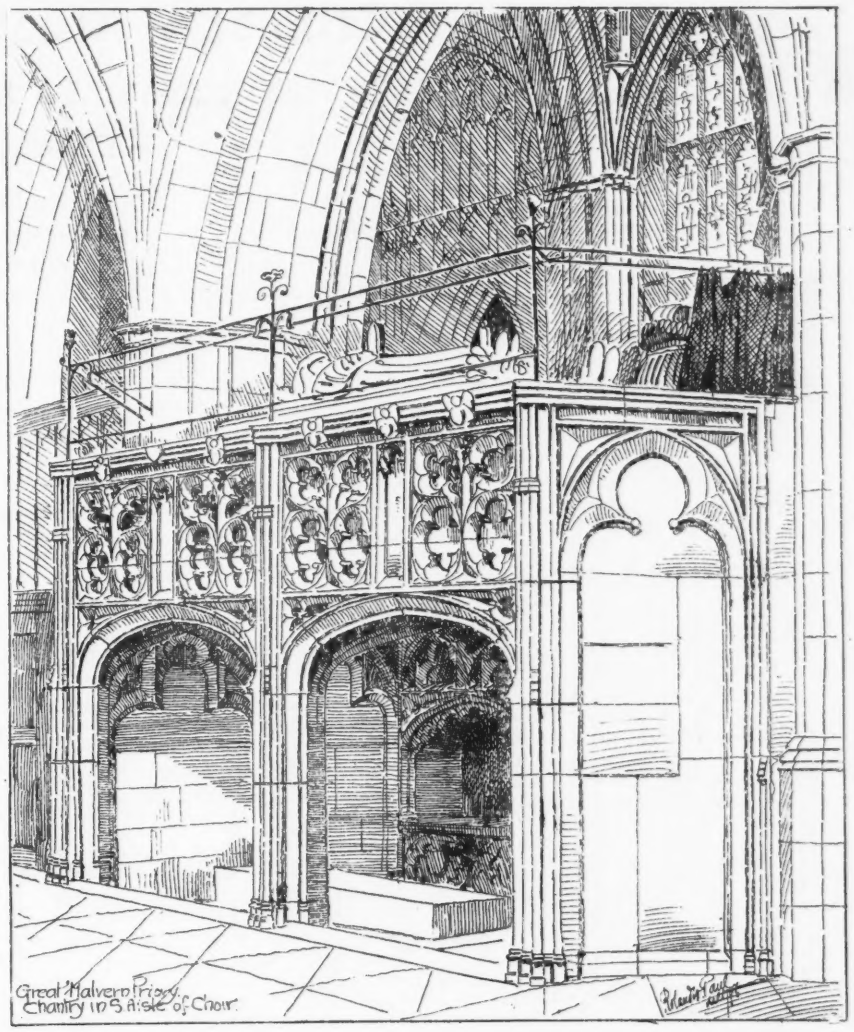
In the "Archæological Journal" of March, 1845, an interesting paper on the legend of St. Werstan, by Mr. Albert Way, gives many points which should be taken in connexion with an examination of the building. According to Leland, the church was erected by the hermit Aldwin about 1084. There was already in existence apparently a hermitage or oratory dedicated to St. Michael, situated between the present church and the beacon, and which may be said to have been the origin of the larger monastic establishment. The spot now known as the "Hermitage" may mark the site of this earlier chapel, and the present church is dedicated to St. Michael as well as to the Virgin.

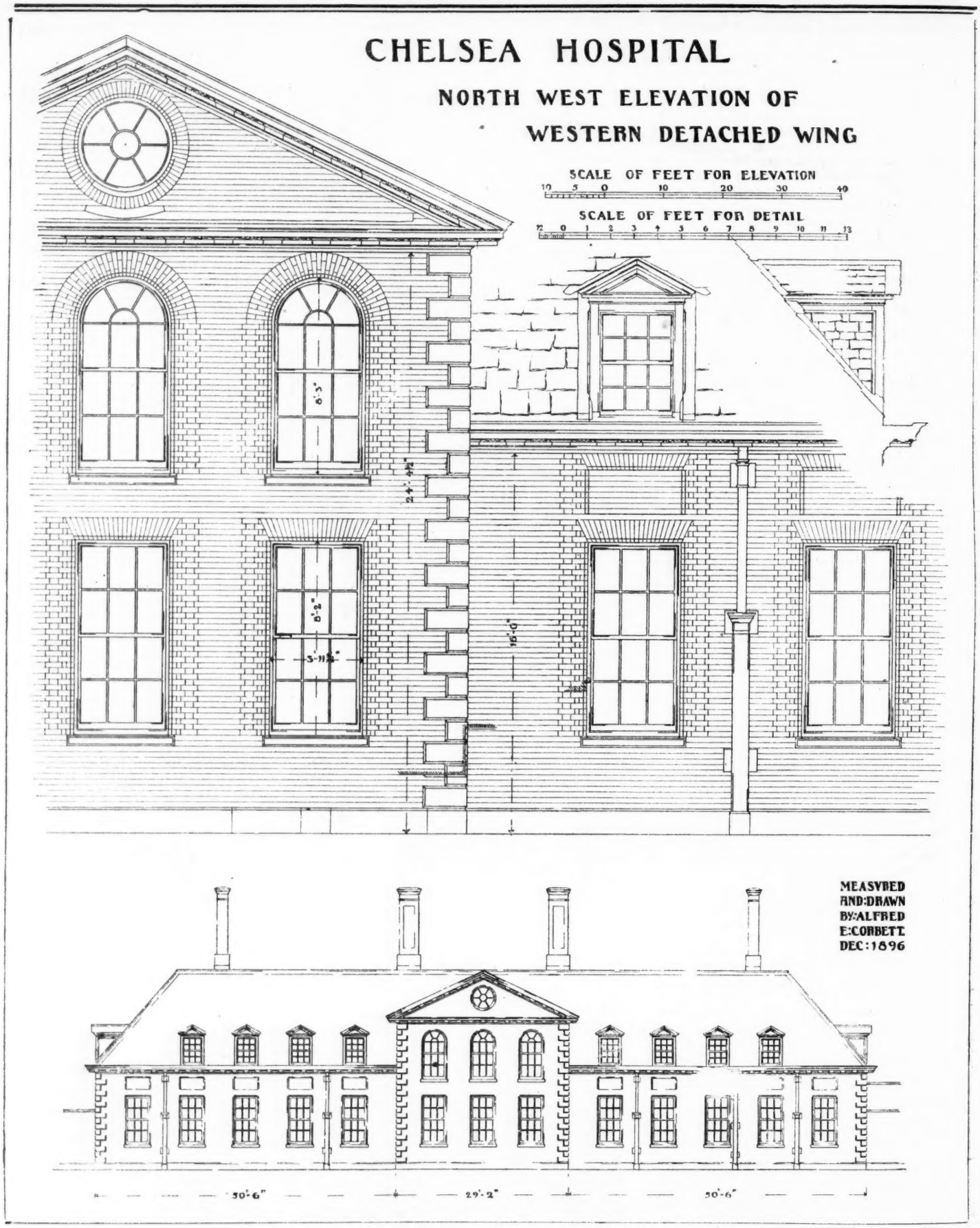
By reference to the ground plan it will be seen that sufficient remains of the Norman work to mark the extent of the nave and its aisles, and also the position of the piers of the central tower. There were doubtless aisleless transepts—perhaps with small apsidal chapels on their east sides as at Tewkesbury and Gloucester — and an apsidal presbytery, but although much of the later planning bears evidence of having been framed on earlier work, there is nothing at present existing which enables the exact extent of the eastern portion of the church to be determined. Whatever additions or alterations might have been made during the three succeeding centuries, nothing at present is visible, and the almost entire remodelling of the church in the fifteenth century has obliterated everything of subsequent date to the Norman work already described. This restoration—or rebuilding—was commenced by



Prior John, of Malvern, about 1450, the presbytery being first dealt with, and the nave was not completed until 1476–1486 — during Bishop Alcock's episcopate at Worcester.

These Perpendicular works consisted in the entire rebuilding of the presbytery and its aisles, with a Lady Chapel projecting beyond, as at Gloucester and Tewkesbury; the rebuilding of the transepts, central tower (the Norman piers being strengthened), the clearstory of the nave, north aisle of nave and north porch, and a portion of the west front. The original width of the south aisle was, owing doubtless to the monastic buildings and cloister on that side, retained; two doorways being, however, made at its west end. The church as at present existing thus consists of a nave of six bays with aisles and north porch, a tower over the "crossing," two aisleless transepts (the south partly destroyed) and an eastern arm of three bays with aisles, two bays of the centre alley forming the presbytery, the eastern bay, an ambulatory connecting the aisles and, before the destruction of the Lady Chapel, forming the approach to it through an open traceried stone screen below the great east window, as now to be seen at Gloucester Cathedral. The nave columns are about 5 ft. in diameter, and 9 ft. in height between plinth and cap. The caps resemble those at Tewkesbury and Gloucester, and, with the exception of a small portion of the north-east respond, are plain (see illustration). The arches are semicircular, and of three orders, without mouldings or labels. The responds at either end are half columns. The bases are circular throughout, but the three western columns on both sides stand on square plinths. This, doubtless, places the position of the rood screen at the second column from the east, and a recess or niche (now occupied by a modern monument) on the west face of the column marks probably the site of one of the lesser altars. Another small niche with ogee cusped head is on the north-east face of the first column from the west end of the north arcade.

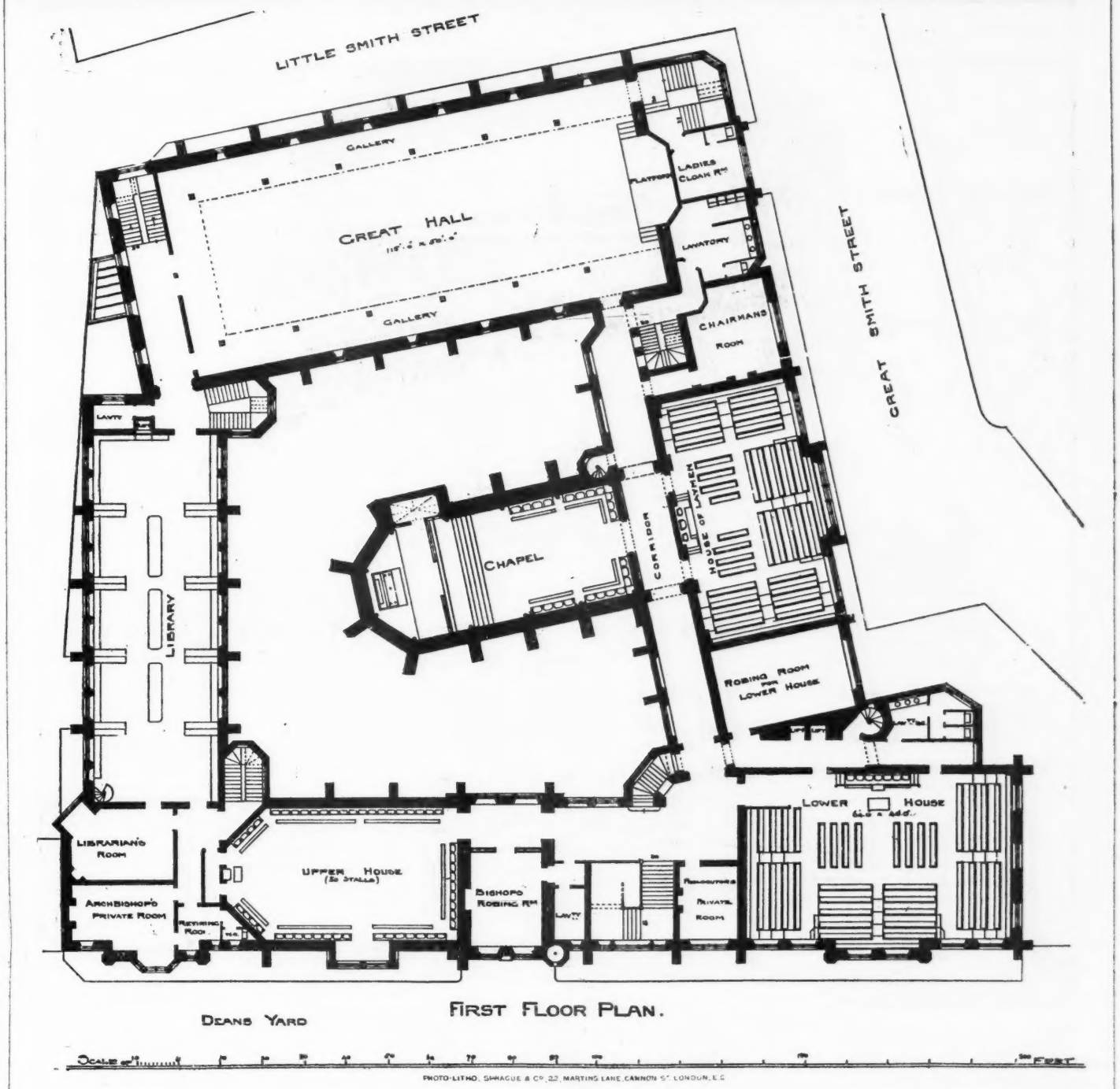




This should be compared with a similar recess at Tewkesbury, near the north porch (see plan of Tewkesbury Abbey in *Builder*, December 1, 1894). The original Norman masonry exists for some little distance above the arcade (see illustration of interior of west-end), and near the site of the rood-screen, already noted, there are evidences of its superstructure in the rough Norman walling. In the south aisle, near the junction with the transept, is the original doorway that led to the cloister, and nearly all this wall is Norman. The north aisle is Perpendicular, with a three-light window in each bay, separated by buttresses, and finished on the exterior with a parapet and pinnacles. In the westernmost bay is a porch, stone vaulted, with a room over approached by a stair in the thickness of the west wall of the aisle. Both nave and aisles are covered with wooden panelled ceilings. The west window is a fine Perpendicular one of seven lights, with a transom. The north transept (formerly the Jesus Chapel) has a six-light window on the north side, and a three-light window and doorwa in its west wall. Two recesses for effigies, no. empty, are in the north wall. Near the flo :e level on the east side are traces of rougher masonry, possibly the remains of the Norman transept, but the Thompson monument, now at the east end of the north choir aisle, formerly stood here, and it is difficult to say whether the roughness of the stonework is original, or caused by its removal.

The south transept has been almost entirely destroyed, and a later wall with three buttresses has been built up to support the south wall of the tower. A portion of the jamb of its east window, close to the angle with the choir aisle, shows it to have been included in the rebuilding in Perpendicular times.

The ritual choir formerly extended at least one ray westward into the nave, and the inner faces of :ne tower piers were kept flat to receive the choir stalls. Some of the seats and misereres, with quaint grotesques, are still used as choir stalls, and placed in two rows on either side in the bay east of the crossing (see plan). Over the crossing rises a fine panelled tower of two stages, crowned by large angle pinnacles, and an open embattled parapet. The belfry windows are of two lights, set between pairs of pinnacled buttresses finishing under the main corni e. In the ringing stage are openings with trefoiled heads, the masonry set back at an angle to give the effect of deep shadow. The north and south sides differ slightly in treatment from the east and west sides, owing to the lower level of the transepts. All these features are shown in the exterior view, taken from what is now the kitchen garden of the Abbey Hotel. The design of this tower will recall the larger one

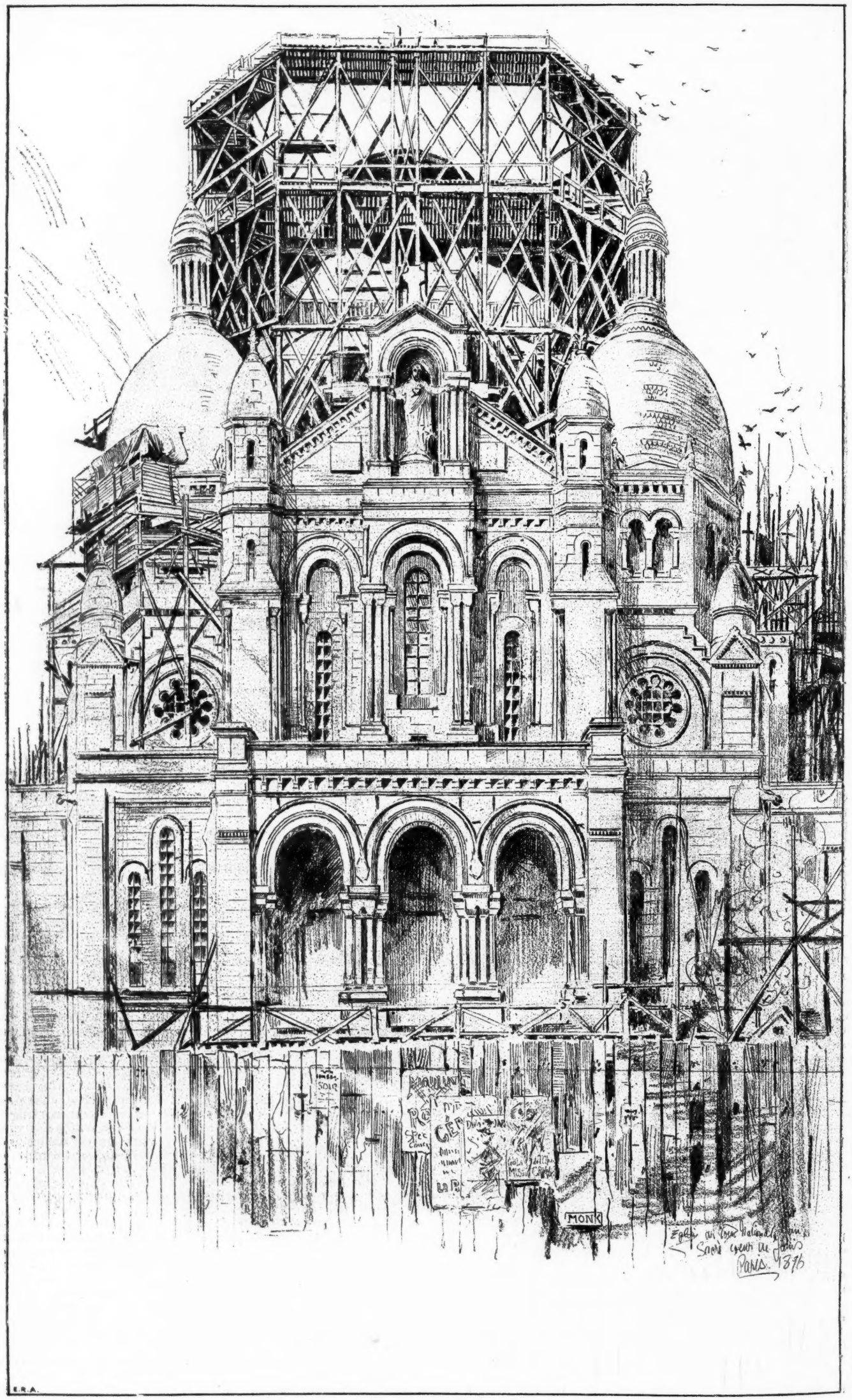


Church House. Plan.

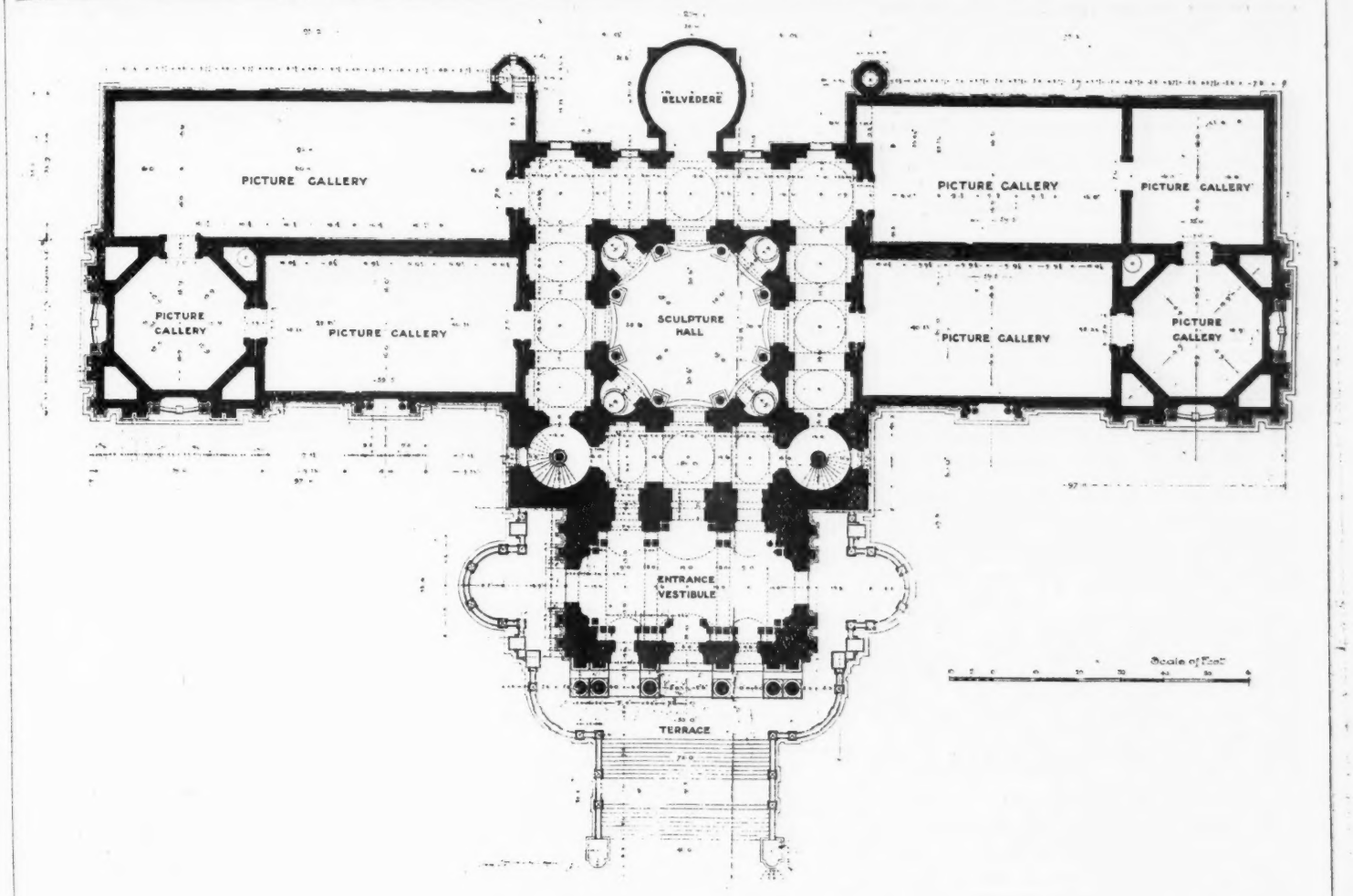
at Gloucester, which in a simpler form it strongly resembles, many of its features, in fact, being identical.

The presbytery of three bays is undoubtedly the earliest portion of the remodelled church. It has boldly designed piers, the mouldings carried round the arches and a shallow cap, or, rather, continuous moulding marking the springing level. At the second pier from the west is the altar screen, with two doorways leading to a space behind, divided from the ambulatory by a curved wall of some height (the altar is approached by four steps, and the side aisles are two steps below the presbytery, thus increasing the height from the ambulatory). It is finished with a moulded cornice, pierced with four small triangular cusped openings. This curved wall is generally considered to be original, and perhaps its form was in some measure due to the apsidal form of the Norman church. Without careful examination of the pier foundations and the space below the altar it is impossible now to say how far the original foundations were utilised, but bearing in mind how much of the early work was retained and recased both at Tewkesbury and Gloucester, it is possible that the form of this wall, and even the position of the piers, might have been fixed by the lines of the Norman Presbytery. The aisles have four-light windows in the side walls, and three-light windows at the east end, and the Presbytery is lighted by clearstory windows of four lights transomed, and a fine east window of eight lights. The south aisle was St. Ann's Chapel. Both aisles are vaulted in stone, but the Presbytery has a panelled ceiling of wood. Some remains of the side walls of the Lady Chapel are left at the east end, showing it to have been about 23 ft. in width. It is said to have been 50 ft. in length.

The monuments, though not numerous, are interesting. North of the altar is an early effigy of a knight holding a circular shield and a battle-axe. It is well illustrated and described in Stothard's "Monumental Effigies." On the opposite side is a tomb of John Knotsford and his wife Jane, 1589. The tomb stands on a vaulted chapel of two bays, open to the south aisle. This contains two arched recesses for tombs, and on its floor lie two early slabs, one commemorating Prior Walchere, of Lorraine, 1113. The floor of this chapel is much below that of the aisle. The view of it from the aisle forms a picturesque feature of the interior (see illustration). In the space behind the altar are some monuments of the Lygon family, and two modern monuments, one at the east end of the north aisle in memory of Mrs. Sophia Thompson, and another to Sir Henry Lambert, designed by Sir Gilbert Scott, at the west end of the nave, complete the list. Malvern Church is, above all, justly celebrated for its encaustic tiles and stained glass. The tiles are mural, and cover the face of the altar screen, the side screen walls, and curved wall of the Presbytery, towards the aisles and ambulatory. They consist largely of a very interesting series of armorial tiles, including those of Edward the Confessor, and the families of De Clare, De Spencer, and Beauchamp, and others. A few of the tiles seem of early date, but the majority are of Perpendicular character, and one or two patterns bear the date of 1453 and 1456, showing them to be coeval with the rebuilding of the church. There are two curious tiles with inscriptions—both from the same mould—one attached to one of the columns of the north arcade of the nave, and the other in the screen wall of the sanctuary on the north side facing the aisle. Other tiles have the emblems of the Passion. Most of the windows in the church retain some portion of their old glass. The great east window, the side windows of the clearstory, those on the south side of St. Ann's Chapel, the north and west windows of the north transept, and the tracery of those in the north aisle of the nave and choir all have very interesting glass of fifteenth century date. Figures under canopies and a series of events in the life of St. Werstan occupy the windows of the choir clearstory. The east window is filled with various fragments of glass, and in the north window of the transept are the kneeling figures of Sir Reginald Bray and Prince Arthur, eldest son of Henry VII., two only of a larger series. In the west window of the same transept are figures of SS. John the Evangelist, John the Baptist and Paul, and the Annunciation, Nativity, and Presentation. St. Ann's Chapel has curious representations of the Creation, while the west window of the nave, said to have been given by King Richard III., has figures of St. George and the Dragon, St. Michael, St. Christopher, St. Lawrence, and St.



Church of Sacré Cœur, showing its present aspect with the scaffolding for the central dome.



National Gallery of British Art. Plan.

Catherine, one or two coats-of-arms, and various fragments, brought from other parts of the church. A good deal of the glass, except that in the north transept, the clearstory, and St. Ann's Chapel, is not in its original place, but all is of the greatest interest and value. With the exception of the stalls, all the fittings are modern. The font is partly ancient, and stands on modern steps at the west end of the nave, in front of the Lambert Memorial.

Of the monastic buildings nothing now remains except the entrance gateway, a few yards west of the church. It has lately been extensively restored, and has a small oriel window over the archway and a panelled front.

The buildings formerly adjoined the west end of the nave, and communication with the church was obtained through two small glazed openings in the lower part of the west window. The refectory has been removed during the present century and the cloister garth is now the garden of the Abbey Hotel, and the hotel itself stands on the site of a portion of the monastic buildings. The ground falls rapidly to the eastward, and adds much to the dignity of the exterior as seen from the east and south-east. The elaboration of the tower contrasts well with the comparatively simple treatment of the nave and choir, the solidity of the plain wall forming in its turn the best setting for the elaborate windows, especially those at the east and west ends. In 1895 a violent storm destroyed some of the details of the exterior, and one of the pinnacles of the central tower fell through the Presbytery ceiling somewhat damaging the floor of that part of the church. At the present time restoration of the destroyed parts, and renewal, where necessary, is being carried out under the able direction of Mr. T. G. Jackson, R.A.

CHELSEA HOSPITAL.

IT has been stated that this time-honoured foundation is about to give way to a scheme for new barracks, a revised system of out-pensions for military service, and a new hospital. In that case we shall lose yet another masterpiece of plan and design by Sir Christopher Wren, who, shortly after Charles II. had laid the foundation-stone on February 16, 1682, was made surveyor-general of the works, completed in 1693. The exterior of the buildings, with gardens extending to the new embankment, is familiar to our readers. The grounds cover 65 acres, lying for the most part south of Queen's-road, which was formed by continuing the way from Stone Bridge, across the West Bourne (at the end of Pimlico-road) to Old Paradise-row, thus separating the Great, now Burton's, Court (14 acres) from the site (7 acres) of James I.'s College, founded by Dr. Matthew Sutcliffe, Dean of Exeter, the Thames Shot (29 acres), and Arnold's Mead (21 acres) on the West Bourne's right bank, and sundry smaller parcels of land. The site of the College was bought from the Royal Society for 1,300*l.*, contributed by Sir Stephen Fox, Paymaster to the Forces, who, according to Evelyn, may justly be considered to have taken a large share in establishing the hospital. The other plots were purchased of Lord Cheyne (Burton Court) and Sir Thomas Grosvenor. Subscriptions of 20,000*l.* to the fund were made by the general public; Tobias Rustat, Gentleman of the Backstairs, and Archbishop Sancroft gave 1,000*l.* apiece; the Army gave a day's pay; and the King resolved, *teste* Evelyn, that "he would settle 5,000*l.* per annum on it, and build to the value of 20,000*l.* for 400 men to be as in a colledge or monasterie." In the result 150,000*l.* was expended. Wren received 1,000*l.*, and in the accounts is an entry of 10*l.* paid, in 1687, to Hawksmoor "for drawing designes for the hospitall." Mr. Beaver says in his "Memorials of Old Chelsea" (1892) that by 1872 a total sum of 289,580*l.* had been spent on buildings and lands. In that amount must be included the sum paid by the Crown for the ground—about 22½ acres in all—on the east side, which the governors had leased in 1690, and later to Richard, Earl of Ranelagh, who in 1698 obtained a grant of the two parcels in fee at an annual rent of 5*l.* per annum. On that land he built a house, and in the grounds was afterwards built the Rotunda, described in our "Note" of February 2, 1895. The Ranelagh site is now part of the hospital gardens, and lies south of the burial-ground, along the west side of Chelsea Bridge-road. The infirmary, formerly Walpole House, to which additions were made in 1809 by Sir John Soane, was originally built on the plot known as Great Sweed Court, leased in early times by the governors to one Jephson, whose house was occupied by the Earl of Orford in 1696-1707, and in 1723-46 by Sir Robert Walpole; the dining-room is now No. 7 Ward. Walpole erected a summer-house and a green-house, designed by Vanbrugh, in a part of his garden, subsequently leased, 1810, to General Gordon. In Gordon House and grounds were held the Military and Naval Exhibitions of 1890-1; their site has been taken for the block of houses designed by Mr. Delissa Josephs.*

In the chapel are Sebastian Ricci's painting of the Resurrection and carving by Grinling Gibbons; the interior is paved in black and white marble, and has Dutch oak wainscot; there is a west gallery, the ceiling is coved in compartments. The organ, by Gray (1817), retains the original case of that presented by Major Ingram; the communion plate is by John Rogers, who in 1687-92 was paid 542*l.* 8s. for it. Rustat presented the bronze statue, by Gibbons, of Charles II., in the big court; he defrayed the cost of James II.'s statue, also by Gibbons, at Whitehall. The gardens were at first laid out after the Dutch mode, by William III., yet their formality, since modified, was in keeping with the general style and character of the hospital. Dr. Burney was appointed organist, through Burke's offices, in 1783, and was there visited in 1791 by Haydn. He is interred in the burial-ground belonging to the hospital. The chapel and great hall each measure 110 ft. by 30 ft.; between them is the saloon, octangular, and lighted by a dome and lantern; the east and west wings of the main court are 365 ft. by 40 ft.; at their ends are the officers' houses. In the long room is an interesting view of the hospital by Peter Tillemans, who came to England from Antwerp in 1708. The general design of the building has been compared to those of the Ospedale dei Mendicanti at Venice, and the Invalides at Paris. The proportions are just, the composition is dignified, and admirably proclaims its purpose by a stately simplicity which nowhere deviates into monotony of expression. Many of the details are highly characteristic, such as the beading around the edges or outlines of doorways, windows, compartments, and niches; we may instance, too, the brick and stone piers, capped with vase-necks and balls, at the several entrances about the courts, and the pyramidal iron lamp-standards over the pumps having large perforated pedestals

* *Builder*, March 28 last, "Architectural Association Spring Visits."

and circular columns enriched with wrought foliage. The particulars we give of the site are taken from surveys made by James Hamilton, *circa* 1680. Burton's Court, on the north side of Queen's-road, opposite the hospital main gates, was converted into a recreation ground for the Guards' Brigade seven years ago. In addition to the general view of the building, we are able to add measured drawings of the detached west wing, by Mr. Alfred E. Corbett, who has kindly lent them to us to assist in illustrating the building.

THE PALAZZO PUBBLICO, PERUGIA.

THE "Town Hall" of Perugia is not the least important of those buildings which meant so much to the mediæval cities of Italy. Although this Palazzo Pubblico has not so graceful a tower as that of Siena, nor so formidable an aspect as the Palazzo Vecchio at Florence, it has a dignity of its own, and an appearance of strength sufficient to illustrate in its day the important position held by the great city of Perugia amongst its fellows. The view shows the entrance from the Cathedral-square, opposite the famous fountain. The chains and iron bar which hang from the two animals or "supporters"—one of which is the Griffin of Perugia, and the other perhaps intended for the Wolf of Siena—are said to be the chains and bar of the principal gate of Siena taken by Perugia as a trophy of victory in a mediæval quarrel. Perhaps some day these chains will be returned by the city of Perugia to Siena, like those which once belonged to the Gates of Pisa, and which were taken by the Florentines some time in the fifteenth century, and lately returned by the city of Florence to Pisa, and are hung now on the walls of the Campo Santo. GERALD C. HORSLEY.

CHURCH OF SACRÉ CŒUR, MONTMARTRE, PARIS.

WE have said so much about this church at different times that it is hardly necessary to repeat the information here, beyond reminding our readers that it was the design of the late M. Abadie, who died however before the building was very far advanced, and has been carried out in the main from his design, though with some modifications which are not all improvements.

The drawing was made on the spot for our pages by Mr. W. Monk, the central dome only, which is still unfinished, being obtained from other sources. We subjoin Mr. Monk's sketch of the building precisely as it appears just now, or appeared two months ago, the scaffolding for the dome having a very picturesque effect.

THE HALL OF THE CHURCH HOUSE, WESTMINSTER.

THE hall of the Church House is the first portion of a group of buildings which, when completed, will enclose an irregularly-shaped quadrangle and occupy nearly the whole space bounded on the north by Dean's-yard, on the east by Tufton-street, and on the west and south by Great and Little Smith streets.

The plan of the first floor as originally designed and adopted shows the general disposition of the various parts, which with certain modifications of detail will, it is hoped, be ultimately carried out.

The arrangement of the Assembly-hall has, in execution, been reversed, the platform being transferred to the east end and another staircase added; in other respects it remains as planned.

The leading idea is that the three Houses of Convocation, the Assembly-hall, the Chapel or Oratory*, and the Library, should all be on the same floor and with easy means of inter-communication. The lower floors are occupied by committee rooms, offices, &c.

Under the new hall on the ground floor and basement are sets of offices for letting, but for the present, by the temporary omission of certain walls and partitions, the ground floor is now being used for meeting-places for the Upper and Lower Houses of Convocation, and for the necessary rooms in connexion therewith.

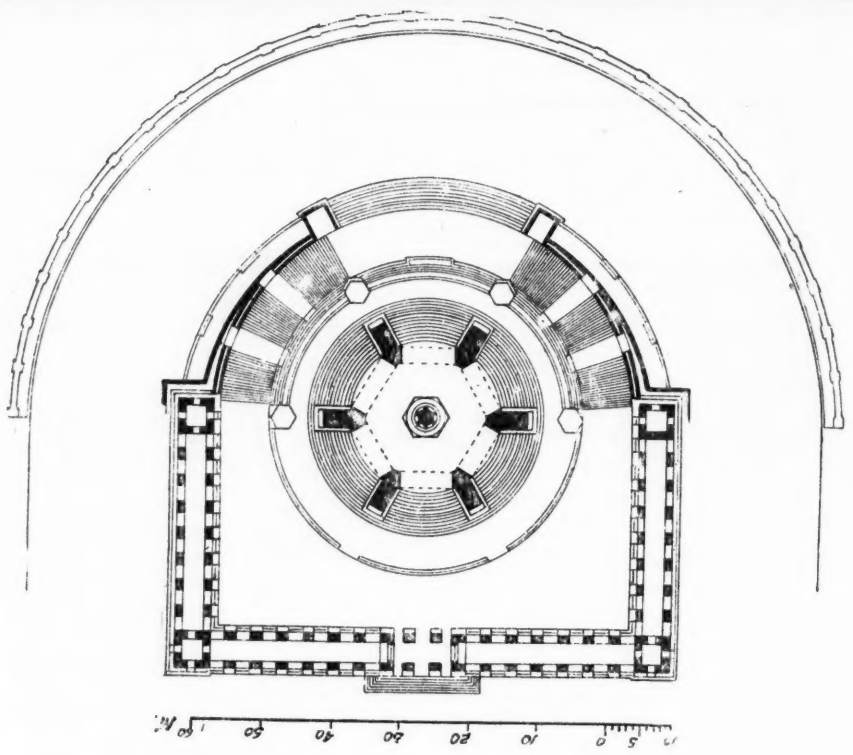
The next section of the buildings to be undertaken is that facing Great Smith-street, which will include the permanent quarters of the Lower House, with committee-rooms, &c., and sets of offices for letting below. These, it is hoped, will shortly be begun.

The Hall needs no description, except to state that the walls are of red brick, with dressings, &c., of Portland stone, Ancaster stone being used internally. The fittings of the Hall and the roof are of oak, the latter being covered with Whitland Abbey slates.

The contractor was Mr. John Thompson, of Peterborough; and the architect Sir A. Blomfield, A.R.A.

It should be added that when the Hall was designed five years ago, an organ was promised by an intending donor, which was to be placed in the Eastern gallery—that end which now attracts attention by a great extent of bare wall. The organ, however, is not yet forthcoming.

* It is, we hear, the present intention to omit the chapel altogether, but it is to be hoped that this decision is not irrevocable.



Monument to the Emperor William I., Porta Westphalia. Plan.

LIVERPOOL TECHNICAL SCHOOLS AND MUSEUM BUILDING.

THE drawing here published represents the building as it will be carried out, the only important alteration in the design, as compared with the original competition design, being the omission of the small dome above the principal entrance, which the architect (Mr. E. W. Mountford) considered would break the curve in rather an unpleasant manner.

There is another reason however for the publication of this view of the building, as Mr. Mountford considered that the perspective drawing submitted in the competition and published in the *Builder* of August 8, 1896, did not show the design in the most favourable point of view.

RESIDENCE, FIFTH AVENUE, NEW YORK.

THIS illustration, which is reproduced from a photograph, represents one of the last of the large houses designed by the late Mr. R. Morris Hunt, and is a good example of his work of this kind, besides being one of the largest and in some respects the most splendid city residence in New York.

As will be observed, the design shows strongly the impression made on its architect's mind by his Parisian education; indeed, but for one or two details which are not according to the "École des Beaux-Arts" standard, it might pretty well pass for an illustration of a Paris "Hôtel."

NATIONAL GALLERY OF BRITISH ART.

WE have before illustrated the original design for this building; the view here given represents the building as it is actually being carried out, with some modifications from the original design; and the revised form of the plan is also given.

The principal entrance doors open into a rectangular vestibule, with an Ionic order 13 ft. high of columns running round the sides, with banded rustication between them for wall surface, all in Portland stone. The ceiling is a plaster-barrel vault, with panelled stone ribs springing from the entablature over the columns. The height from the pavement to the crown of the vault is 25 ft. 6 in. From the vestibule is entered a corridor 12 ft. wide, which surrounds the central (octagonal) sculpture hall. From this central corridor all the various picture galleries are entered, and they have been so arranged that there is no necessity to retrace one's steps.

There are seven picture galleries, three of them being 59 ft. by 32 ft.; a long gallery, 93 ft. by 32 ft.; a square gallery, 32 ft. by 32 ft., and the two before-mentioned pavilions, shaped internally as octagons, and having a breadth of 32 ft. The picture galleries are all top-lighted, the ceilings being formed with elliptical panelled plaster ribs and ornamental spandrels. The pavilions are lighted from the top by a glass dome, with panelled and ornamental plaster ribs and cornices. The glazing used for lighting the galleries has been W. E. Rendle & Co.'s patent throughout.

The stairs are entirely treated in white marble. The central sculpture hall is open at the first floor, and has an arcade of coupled Ionic columns, with curved balustrades, dividing it from the upper sculpture gallery (which runs all round). The basement of the building is divided up into rooms similar to the galleries, and will be used for picture receiving and cleaning, students' easels, store rooms, and boiler house.

The basement is entered from the ground floor by circular staircases, which also lead to the lavatories and cloak-rooms.

The whole of the carving has been executed from models made at the works, from full size drawings by the architect for every part, which have been given to the modeller, the general treatment being Greek in feeling.

The floors of the central portion will be in Sicilian marble and marble mosaic, and the galleries will have polished oak floors.

The warming and fire appliances are being carried out by Messrs. Z. D. Berry & Sons; the drainage and sanitary fittings, &c., by Mr. Geo. Jennings; the whole of the ironwork was executed by Messrs. Handyside & Co.; Mr. Stone has supplied all the casements and window fittings, the glazing for them being by Mr. W. Ramsey; roof glazing, as before mentioned, by Messrs. W. E. Rendle & Co.; Messrs. Dennett & Ingle's fireproof construction is used in all floors; Messrs. Waygood supplied the lifts, and Messrs. Hayward the prism lights; the carving has been carried out under the direction of Mr. Christopher Smith; and Messrs. Drake & Gorham and Mr. Russell are responsible for the electrical lighting.

The contractors for the building are Messrs. Higgs & Hill; Mr. C. Coggin represents the architect, Mr. Sidney R. J. Smith, on the works. In addition to the building, Mr. Tate, the donor

of it, is presenting also a fine collection of British paintings of great value.

The perspective drawing was made by a pupil of the architect's, under his supervision.

The building is now nearly all roofed in and the picture galleries (except floors) practically completed, so that it is hoped that the formal opening will take place the middle of next year.

The Trustees of the National Gallery will have the charge and care of this building, and arrangements are already being made as to the pictures, of which Mr. Tate's fine collection (which he will present) forms the nucleus. The original design prepared by Mr. Sidney Smith showed a lofty central dome, but at the wish of many artists (more particularly that of the late Sir Frederick Leighton), who were afraid of a shadow being cast by this circular feature on the galleries themselves, he was obliged to eliminate it, and the design, after many revisions, is now being finally carried out as shown.

MONUMENT TO EMPEROR WILLIAM I.

WE have frequently had occasion to refer to the many monuments which have been erected throughout Germany in memory of the Emperor William I., and have in many instances given particulars of the competitions which were opened with a view to obtaining suitable designs, in many of which Herr Bruno Schmitz was the successful competitor, and his competition successes have often been followed by commissions to act as architect where the schemes have been carried out.

The design here illustrated may be said to be one of Bruno Schmidtz's typical monuments, which are primarily architectural memorials. As in other monuments by the same architect, the advantage of a prominent position has been given, coupled with the requirement that the memorial should be essentially a land mark, the actual statue of the deceased monarch being only of secondary consideration.

The small plan which is appended sufficiently explains the design, which in its execution presents an admirable piece of masonry work. The cross at the top is about 50 mètres above the terrace. The situation is on the side of a hill. The cost, exclusive of the statue, has been about 25,000*l.*, and with all expenses, levelling and the statue, about 40,000*l.*

The idea of having a monument for the province of Westphalia dates back as far as 1890, but there were great difficulties in finding a suitable site. Work was not commenced until 1892, and the monument has only lately been inaugurated. Herr Bruno Schmidtz—who has now been made a Professor—had sole charge of the execution; the sculptors who participated being Professor Caspar von Zumbush, of Vienna, for the statue, and Messrs Vogel and Schwartz, of Berlin, for the bas-reliefs. The statue, which measures seven mètres and stands on a pedestal five mètres high, is of bronze, and comes from an Austrian foundry.

MONUMENT TO WATTEAU, PARIS.

THIS monument has been recently erected in the garden of the Luxembourg, as the result of a public subscription. The pedestal, in white stone, was executed after the plan, and under the direction of M. Henri Guillaume, architect (son of the former architect to the Louvre). The pedestal takes in plan the form of a painter's palette, forming in elevation a semicircle with steps attached. The figure of the woman in Louis XV. costume, seated on the balustrade, is the work of M. Henri Gauquié, who is also the sculptor of the bust of Watteau which surmounts the stone stele forming the *extremity* of the balustrade. The bust is in pewter, the silvery lustre of which forms an effective contrast with the rest of the work and with the surrounding foliage.

THE "BUILDER" ALBUM OF ACADEMY ARCHITECTURE.

THIS publication, which we have issued annually for some years back, is now ready, and will be in the hands of those entitled to receive copies in a few days. We may here call attention, however, to the improvement which has been made in it by the addition of plans and descriptions of the buildings or designs illustrated, so that it is now no longer only a collection of drawings of buildings, but affords the opportunity also for studying their plans.

A copy of the Album is presented to every architect or artist who has contributed to its contents. The price of surplus copies to non-contributors, which was formerly a guinea, has now been reduced to half a guinea.

ALMANACS AND DIARIES FOR 1897.

MESSRS. HUDSON & KEARNS, of 83, Southwark-street, S.E., have issued their well-known diaries and blotting-pads for 1897, the merits of previous issues of which we have referred to on former occasions. While not presenting any new features, the diaries and pads are as well arranged as ever, and their get-up leaves little if anything to be desired. "The Architect's Diary," which is issued in two sizes, Nos. 12 and 13 (one and two pages to a day respectively), is not only valuable as a diary, but also for the information likely to be needed by architects which is published in it. The issue contains a list of cases decided in the superior courts of justice during the legal year from November, 1895, to August, 1896; revised regulations under the London Building Act, 1894; the Metropolis Management and Building Acts Amendment Act, 1878; names and addresses of district surveyors, &c., as well as the usual postal and other information. The section entitled "Architecture and Archæology"—*i.e.*, a list of some London and provincial architectural and archæological societies—which is apparently complete as far as it goes—does not go far enough, seeing that several provincial societies are omitted from the list. A little more revision of this section in future issues would be desirable. "The Builders' Diary," No. 11, and "Diary and Note Book," No. 9, contain much of the special information to be found in the Architects' Diary. "The Builders' Diary" contains some useful practical tables. The same firm have sent us some of their date-indicating blotting-pads in various styles and sizes. "The Bankers' Pad" is a specially good form.

"The British Almanac and Family Cyclopædia of Useful Information for 1897" (Charles Letts & Co., Royal Exchange, for the Stationers' Company) is the seventieth issue of a very useful annual. The publication is illustrated, and the aim of the publishers appears to be to produce the most popular annual of this kind.

"The City Diary and Almanac for 1897" (Messrs. W. H. & L. Collingridge, 148 and 149, Aldersgate-street, E.C.) is the thirty-fourth issue of this annual. It is interleaved with blotting-paper, and is a handy and neat little work, containing a large amount of information in regard to the City and City affairs.

"The Railway Diary and Officials' Directory for 1897" (London: McCorquodale & Co., Limited) is a work likely to prove of value to some of our readers, as it contains information as to traffic returns, accounts, dividends, lists of officials, &c. The "Railway Almanac," issued by the same publishers, is an interesting sheet.

We have referred before to the many excellent features of "The Indian and Eastern Engineer Diary" (Calcutta, and London, 28, Victoria-street, W.), and the issue for 1897 is as well arranged and as useful as previous issues. The publication is presented to yearly subscribers to "The Indian and Eastern Engineers." It is to be regretted that the cover of the issue and the interleaved blotting-paper are covered with advertisements.

"The District and Parish Councillors' Diary and Guardians' Manual for 1897" (Messrs. Hazell, Watson, & Viney, Limited) contains the full text of the Local Government Act, 1897, a concise digest of its provisions, and most of the enactments incorporated with or referred to in the Local Government Act, the members of the Local Government Board, and a mass of useful general information. It also contains a diary of two days to a page, with memoranda for the guidance of Guardians and others. The work is handy in size and admirably got up.

Messrs. Dargue, Griffiths, & Company, Limited (specialists in warming and ventilating, 15, Lord-street, Liverpool), have sent us a handy little diary for 1897; and from the Limmer Asphalte Paving Co. (Moorgate-street, E.C.), and the Rugby Portland Cement Company, we have received their respective almanacs for 1897, which are illustrated and mounted on cardboard.

"The Gloucester" Diary and Directors' Calendar for 1897 (W. H. Brigden & Company, Gloucester, for the Gloucester Railway Carriage and Wagon Company, Limited), is the second issue of a handy little diary.

"The Gardening Year Book, and Garden Oracle for 1897" (W. H. & L. Collingridge, Aldersgate-street, E.C.) is the thirty-ninth issue of a valuable little work for gardeners.

Books.

The Preservation of Open Spaces and of Footpaths and other Rights of Way. By SIR ROBERT HUNTER, M.A., Solicitor to the Post Office, formerly Honorary Solicitor to the Commons Preservation Society. London: Eyre & Spottiswoode. 1896.

TIME was when commons and footpaths were of no interest to the dwellers in towns, they were of importance only to those who lived in country places, often very remote from the centres of life. But this is now changed. The extension of the towns of England has brought them into contiguity with various open spaces, so that the commons which at one time were simply places where some few people pastured their cattle, or from which they cut gorse or bracken, have now become important as places of recreation and refreshment. The pathways, which at one time were traversed only by agricultural labourers on their way from the fields to the cottages, are now of importance to men who spend their days in city life. The railways, too, have brought the townsman into close touch with rural life, and he values the woodland footpath perhaps more than the tiller of the soil.

A work at once practical and legal, which can be read by the layman, and is also useful to the lawyer, has thus for some time been needed. It is satisfactory to find that a competent writer has taken up the matter, with the result that the book at the head of this review will for a long time to come clearly remain the standard work on the subject of which it treats.

It is obvious that the modern interest in commons is in them as places of recreation, at least so far as readers of this journal are concerned. We do not propose, therefore, to touch on rural rights of common. What we are concerned with are rather rights of recreation over open spaces, whether they are what are commonly called commons or village greens.

The first point to bear in mind so far as recreation is concerned is that, in order to justify the playing of games on a common or a green, a custom must be proved to this effect. Moreover, a right so proved does not extend to strangers, but only to persons who live in proximity to the open space. In these days the popular idea of commons and greens is that they are essentially places for recreation. To some extent this may be true of village greens, but certainly the object of commons was that they might be employed for purposes of utility as for example, that the commoners might feed their sheep on them. The world at large may obtain rights of way over them, but more than these they cannot claim, and these only when they are proved by distinct usage.

It is well, however, to bear in mind that the commons near London are now on a different footing to those in the country; for three Acts, beginning with the Metropolitan Commons Act, 1866, are applicable to commons within the Metropolitan Police District, which extends for a long distance outside London proper. In any scheme for the regulation of commons under these Acts the governing body is empowered to set apart portions of the commons for games, to form cricket grounds, and to enclose such parts for their protection. Thus in the Metropolitan area the essential character of commons has totally changed from what it was in the past. They have ceased to be places for use for agricultural purposes, and have become places useful to the neighbourhood for purposes of health and recreation. There can be no doubt that the tendency of legislation and of public opinion is running in the same direction in regard to other commons than those near London. It is indeed a serious question whether the provisions of the Metropolitan Commons Act might not well be extended to all commons within a radius of twenty-five miles of Charing Cross. The protective Act, for what may be called provincial commons, is the Commons Act, 1876, which declares "that it is desirable that enclosure in severalty as opposed to regulation of commons should not be hereafter made, unless it can be proved to the satisfaction of the Commissioners, and of Parliament, that such inclosure will be of benefit to the neighbourhood, as well as to private interest and to those who are legally interested in any such common." The difference, however, between the policy of the Metropolitan Commons Act and this Act is that regulation under the former can be carried out without the consent of the parties actually interested, but under the latter it requires the consent of persons representing two-thirds in value of the legal interests in the common, and

gives the lord of the manor, in the case of a manorial common, a veto upon regulation. The difference in theory is obvious: in the Metropolitan area the public interest is held to be paramount, in provincial districts the public interest is to be considered, but private interests are held to be of higher importance. Sooner or later the former theory will have to be extended beyond the present narrow extent, and it should for some reasons be done promptly. There are now to be found commons outside the Metropolitan area which are becoming surrounded by houses; these commons are undrained, and frequently tend to cause ill health; their open character is more than counterbalanced by the sodden nature of the soil.

We do not propose to state the technical steps by which a common can be placed under the care of a local authority. It is sufficient to say that under any such scheme provision is made for draining, manuring, or levelling a common, planting or improving it, making by-laws for the prevention of nuisances or the preservation of order, for general management, and for the appointment of conservators. There is no doubt that any such scheme is most desirable in the interests of residents near a common, though it is to be hoped that good sense will prevail in one particular, viz., that no attempt will be made to *improve* the natural beauty of a common, which is still in an untouched state. On the other hand, there are some commons round the edges of which some planting of timber would be for he benefit of future inhabitants.

The subject of footpaths is, in many respects, of no less importance than that of commons; it is in the public interest that they should be kept free and open, and any one who wishes to know how this should be done may well read what the author of this treatise says on the subject. The main point to bear in mind is that once a right of way is established, it cannot be lost except by means of certain public measures, and after it has been shown that such way is useless, or that some equivalent is given for it. No footpath can now be destroyed where the local public is reasonably vigilant, and we hope that in every part of rural England these important rights will be kept intact.

Der Bau des Reichsgerichts zu Leipzig. By VOLKMAR MÜLLER. Berlin: Georg Siemens, 1896.

WE have much pleasure in calling attention to the excellent series of descriptions of well-known modern public buildings in Germany issued by Mr. Georg Siemens, of Berlin, of which this guide to the Imperial Law Courts at Leipzig is a second number, the first having been the guide to the new Houses of Parliament at Berlin. The guide-book under consideration is well written and shows the sound architectural knowledge of the author—Herr Müller. It is illustrated by five views in photo-lithography and two plans. The frontispiece is a photograph of the architect, Herr Ludwig Hoffman, who now occupies the office of City Architect in Berlin. The book commences with some notes on the general requirements of German public buildings, followed by a description of the plan from an architect's point of view, and the guide proper, which then follows, is written in such sequence as to conduct the visitor through the whole building in an easy and intelligible manner. The pamphlet ends with some criticisms, which are, of course, written from the German point of view, and some historical and technical notes as to the construction of the building. It would be well if similar guide-books were available for our modern buildings, and for the matter of that for older buildings, for the guide-books offered for sale in this country are generally beneath criticism.

Practical Hot-Water Heating, Steam, and Gas-fittings. By JAMES J. LAWLER. New York: Excelsior Publishing House.

THIS is short, practical treatise on each of the three above-named subjects by an American. We do not quite like his tone, and the following paragraph gives an idea of it:—"And since Americans pay well for American brains, the wonderful improvemen's made in the line of sanitary appliances for domestic purposes within the last ten years show that they have lost no time, and have outstripped every other country on the face of the earth, no matter how old it may be." And again:—"How much we thought the customer would pay where we had the inside track." These are not necessary remarks in a book which is essentially one for fitters and the trade. There are some useful tables and advice to those about to set out lines of pipes, but there is nothing above the average. We highly approve of the advice given, that all mechanics engaged in the special branches should study their own trade journals at least, if not some of those outside their own line in addition, as nowadays it is necessary for a man to be able to take advantage of all the latest improvements if he wishes to do work which shall be up to date. A great portion uf the book is taken up in descriptions of the various sorts of fittings used in the States, and very useful it will be in that part of the world; but only one short chapter is devoted to the "one pipe" method of heating by hot water. and we should have liked some information as to steam heating from large centres.

Hints to Plumbers on Joint-wiping, Pipe-bending, and Lead-burning. By JOHN W. HART, R.P.C. Smith, Greenwood, & Co. 1893.

THIS work is stated to be a collection, in book form, of a series of articles which have appeared in the *Decorators' Gazette and Plumbers and Gasfitters' Review*, suitable for students joining practical plumbing classes, and as such should fulfil its object, as the information given is clear and to the point, although, of course, some advance has been made in the methods since 1893, notably in pipe-bending. For pipes of large bore a new machine by which a bend on a 4-inch pipe can be made in about ten minutes will take the place of the laborious system in use heretofore, which occupied at least a couple of hours. Almost all the types of joints are treated in detail, and a study of them should be of great advantage to the young plumber. Very good advice is also given on a burning subject on works, viz., the reckless way in which plumbers damage all the surrounding work to carry out their particular object, their capacity for doing damage being only equalled by the electric light fitter. It is to be hoped the students will profit by the advice of Mr. Hart, and exercise more care in future. A very great improvement in this class of text-book would be to employ a good man to design the few sketches where an opportunity for such occurs. One of the difficulties of the craftsman is that he is not brought into contact with good design, which would tend to elevate his taste, and an opportunity has been lost in the few sketches of heads and tacks on rain water pipes. It is no excuse that the book is a purely practical one, that the sketches should not show some good design where possible.

A Practical Guide to Warming Houses from the Kitchen Fire by Low Pressure Hot Water on the One-Pipe System. By THOS. POTTERTON.

MR. POTTERTON'S work is of the trade catalogue nature, giving diagrams of a boiler which he has invented to be used in place of the ordinary range boiler, giving a large heating surface and so more power, the flame being made to take a zig-zag course up the centre. With this increased power it is proposed by the inventor to heat portions of houses by means of radiators, as well as supply hot water for domestic purposes. Various diagrams are given showing the best means of carrying this into effect, nearly all on the one-pipe system, and the general idea of economy in making the one fire serve the two purposes is a good one, and would no doubt answer under some circumstances. We are not sure whether it is to be recommended in cases where the water leaves a large amount of deposit, as in that case the whole of the pipes would have their interior more or less coated, reducing the heating capacity largely. This is obviated in the ordinary hot-water system by using the same water over and over again, adding only enough to make up for evaporation and other slight losses. As giving information upon the "one-pipe" method of heating, the book is well worth study. No doubt Mr. Potterton's system would be useful in careful hands, and his hints to fitters as to the best methods of running pipes and such like technical points will be greatly appreciated by the trade in general.

Unsere Kirchen und Gruppirter Bau bei Kirchen. By OTTO MARCH. Berlin: Ernst & Sohn. 1896.

THIS publication, which has been well illustrated, is practically the reprint of various articles which have appeared in the *Centralblatt der Bauverwaltung* and in the *Bayreuther Blätter*. Its purpose is to advance the methods of church building in Germany, especially for small provincial towns and rural districts, and there is much in the arguments and illustrations of the church architecture recommended by Herr March that reminds one of the principles adopted in many of the small American townships, where, with due regard to purpose, we find those interesting combinations of church, vicarage, schoolroom, &c., all contained in one block. At a time when church building has become exceedingly popular throughout the German Empire, owing to the influence of the Emperor, the publication should be of considerable service to the communities or to those in authority in the localities concerned. In this country we do not think Herr March's proposals would find much favour, as church building on a small scale and for small parishes has already developed to such an extent as not to necessitate reference to a study of this description. The book, which includes twenty-four pages of text and five plates of illustration is, however, in every way a pleasing one, and the literary portion shows much thought and a thorough knowledge of the requirements of the country for which it is intended.

Mittheilungen über das Verhalten Hydraulischer Bindemittel. By GERHARD HERFELDT. *Notizblatt des Deutschen Ziegler- und Kalkbrenner-Vereins.* By FRIED. HOFFMANN. Berlin. 1896.

THESE two publications particularly call for the attention of our building trades and manufacturers, as they are excellent examples of descriptions of research work carried out in connexion with the testing of cements, mortar, bricks, and other artificial materials. Throughout Germany the subject of the manufacture of building materials is receiving the serious attention of the respective Governments, the Local Authorities, and the trade societies, and the result is that a very considerable amount of literature on the various sub-sections of the subject has been already put together. The *Notizblatt*, in particular, refers to the work of the brickfields and the limekilns, whilst the *Mittheilungen* makes particular reference to the various kinds of mortar. The issue of these publications will be at irregular intervals. The present number of the *Notizblatt* treats of a very interesting discussion at a Trades' Congress on "The Preparation of Lime," and on "Brickmaking"; whilst in the *Mittheilungen* the subject chosen is the "Effect of Sea-water on Mortar." The latter publication contains very extensive statistical details.

TRADE CATALOGUES, &c.

ONE seldom has to complain that firms do not advertise their names sufficiently large on the cover of their catalogues, but Messrs. O'Brien Thomas & Co. (London) go to the other extreme in sending us a volume of more than a thousand pages without any name on the back, or any title page, and it was only after some search through its pages that we succeeded in discovering the name of the firm, incidentally occurring in a specimen of a form of letter for making complaint to a railway company about damaged goods. This is much better taste, no doubt, than the prominent display of the name that we often see: but its entire omission may lead to mistakes a well as to inconvenience. The catalogue itself is a large and important one, including everything in the way of general ironwork—stoves, mantels, lavatories, railways and gates, sanitary and hot-water fittings, electric bell fittings, garden furniture, gaseliers, laundry machinery, kitchen utensils and household ironmongery generally. It is well and clearly arranged and printed.——Messrs. Robert Jenkins & Co. (Rotherham) send us a catalogue of wrought-iron and steel boilers, with exceedingly well executed and practical illustrations, not merely pictures of the articles, but constructional sections. The Instructions for Telegraphing orders, so as to ensure getting the type and fit of boiler required, are clearly worded and useful. In a note accompanying the catalogue they draw attention to the fact that the heating powers have been altered to what may be expected under average conditions.——Messrs. W. Richardson & Co. (Darlington) send us their illustrated catalogue of conservatories; these illustrations are entirely pictorial; they serve to show that some pains are taken to give the conservatories as good an aspect as possible.——Messrs. Jessop & Appleby (Leicester and London) disguise what is really a trade catalogue under the semblance of a practical treatise Appleby's "Illustrated Handbook of Machinery"; the book does contain a good deal of useful and practical information besides the diagrams and prices of various machines; but it is a priced catalogue all the same, and we like things called by their right names.——The Crittall Manufacturing Co. (Braintree) send a handsome and decoratively

got-up book of their metal casements and other metal work, such as stays, handles, &c., as well as party-wall doors. The metal stays are well designed, the arrangement of the catalogue is exceedingly, the drawings large and clear, and the whole gives an impression of representing the best class of work.——Messrs. Oates & Green (Halifax) send a catalogue of sanitary specialities, gullies, pipes, salt-glazed sinks, &c.; and the several forms of latrine shown, made of highly glazed "Nalethric" stone ware, appear, as shown in the drawings and described, to be among the best forms of latrine for working with automatically applied waste water that have been devised, from their simplicity and the nature of the materials. —— Messrs. Ames, Garrard & Co. (London) send a set of sheets of design for electric light fittings, as specimens of the kind of fittings they are prepared to design for each client, instead of keeping stock patterns, a system which we entirely approve of, and the examples sketched here, for execution in wrought iron, are graceful and in good taste. They are all arranged to be used without unscrewing or taking to pieces.—— Messrs. W. Richardson & Co. (Darlington) send another example of what we may call the essay-catalogue, being really illustrations and descriptions of work done by the firm, under the title, "Hints on Heating;" though the compilers do admit that methods are employed which they do not describe; but within its own limits their pamphlet is useful to intending purchasers.——Messrs. A. C. Wells & Co. send the description and illustrations of their plant for painting by machinery, both by compressed air and steam, a process exceedingly useful where large areas have to be painted.—— Messrs. R. H. & J. Pearson (London) send an illustrated catalogue of what they term the "Rumford Teale" and Rumford Armstrong fire-places, which are intended to combine the principles of Rumford and Mr. Pridgin Teale. They are made with a preponderance of fireclay and with little iron; we may add that the fire-places are much better designed and much better drawn than we generally find them in trade catalogues.——The Swan Electric Engraving Co. (London) send an illustrated catalogue of specimens of drawings &c. reproduced by their excellent process, which has occasionally been employed in our own pages. The drawback to it from our point of view, is that the size of the plates producible is somewhat limited, but otherwise we have nothing but praise for the results. ——Mr. W. F. Stanley (London) sends us the new edition of his catalogue of drawing instruments, which contains several alterations, and the addition of a telegraphic code for ordering the principal articles.——Messrs. T. Bagshaw & Co. (Batley) send us a catalogue of wrought iron pullies, shafting, and friction clutches and couplings, with some practical rules for transmission of power by shafts, wheels, ropes, and belts.——The Universal Sewage Purification Company (Derby) send a descriptive and illustrated pamphlet of their important system of chemical precipitation through upward flow tanks, which should have the attention of those who are about to carry out work on sewage farms.

Correspondence.

To the Editor of THE BUILDER.

PETERBOROUGH CATHEDRAL.

SIR,—It is difficult for one who has not inspected the Cathedral to form any absolute opinions on the controversy, but on one point I think most architects will cordially agree, and that is in deprecating the very absurd suggested reference to an engineer.

On a question of strains in ironwork, or of pure science and mathematics, an engineer's opinion is valuable, but on a question that is almost entirely one of experience and of judgment founded on practical knowledge, there is no one with any public claim to competency to compete with that of an architect.

Most of us are, I hope, quite as well able as an engineer to make any small calculation necessary as to the question of weight to be placed on stonework, although a small section of architects wish to rid themselves of such responsibility; but in this case no powers of calculation can be of the slightest use. An engineer has less experience than any one connected with building in the repair and patching up of old buildings, whereas very few architects are unfamiliar with such matters. Those who invoke the aid of the engineer might do well to remember the fate of that British Prince who, to resist the inroads of the Picts and Scots, called in the assistance of Hengist and Horsa.

I cannot agree with Mr. Thackeray Turner that the increase of weight on the piers will be but small. On the contrary, it must surely be very considerable, and the danger to the piers that you have yourself pointed out must be great. Neither does Mr. Webb's plan of joggling long-stones on to the facing commend itself to me at all, since of all material stone combines the maximum of weight with the minimum of tenacity. The best material for the purpose, if it be feasible at all, would surely be Portland cement concrete imbedding iron or copper bars. The cement must, of course, be well slaked, and the aggregate should be ash clinkers or gas breeze, so that the weight may really be reduced, as well as perfectly distributed. I have used this material pretty constantly in repairing old walls, since it can be conveniently packed into all sorts of places.

I can hardly help thinking the method might be used in this case and save the destruction that we all deplore. I find a good many architects share my regret that those in charge have not agreed to meet so general a wish as has been expressed to give time for a further and fuller consideration of the matter, even though the original plan has to be eventually carried out.

RALPH NEVILL, F.S.A.

"BRICKWORK TESTS."

SIR,—As one who was present at the reading of papers by Messrs. W. C. Street and Max Clarke on the above subject, I should esteem it a favour to be permitted to make a few remarks suggested by the discussion arising thereon.

In the first series of tests, the papers and resulting discussion and correspondence played round the question of the kind of bricks used in the tested piers, coupled with the use and position of the closer, in which all agreed, as far as one could learn, that the closer constituted the real source of weakness in the initial line of cleavage or fracture (a conclusion which I fail to see has yet been upset). And this would be more especially so in practice as compared with the tests. For, in the one pier yielding the greatest result in the second series of tests, Mr. Max Clarke told the meeting that all the queen-closers were cut by himself (doubtless true and workmanlike), whereas on the building—unless under strict supervision—any brick spawls often serve for interior closers, with an abundance of mortar to make up the deficiency of brick. The President, in dealing with the subject of supervision, and the great difficulty of carrying out the same conditions on the building as in the case of the testing, remarked that the bricklayer has to do a day's work, a sentence into which may be read more than one meaning; and for that reason any ultimate conclusions arrived at from data obtained by these tests must, to be of any value, be based on a large margin of difference between the conditions of testing and the conditions of building in actual practice.

In the second series of tests the subject has been dealt with more as a whole—especially so with respect to the all-important questions of sand and supervision; and if architects would always specify the use of river sand, failing which, that pit sand shall be sharp and clean washed, free from loam and other impurities, we should be working on lines that make for good results. The engineer is no less concerned about the quality of his sand than that of his cement. He bases this faith in methods and conditions, knowing that if these be good, satisfactory results must ensue.

It would be interesting to know whether the piers tested were built with bricks (not the Staffordshire blues) wetted to saturation and allowed to drain; or whether they had been wetted at all. Whether the mortar (lime or cement) was mil-lmade (ground) or hand-made; conditions which materially affect results in practice; it being generally accepted that hygrometric conditions of atmosphere affect the ultimate strength of brickwork in course of erection; or, in other words, that a wet building makes a dry house, and *vice versa;* the best results (as far as strength goes) being obtained in water-bound brickwork where crystallisation has been induced by the continued presence of moisture.

Another interesting experiment would be with similar piers, built with mortar newly made up, which one so often sees specified, and which my own personal experience teaches me to believe is wrong in principle and practice—except during the winter months—and with mortar that had been made up some time, and retempered before use.

Though the frog in a brick be a source of weakness in the brick itself by reason of the diminution of material substance, yet the frog is necessarily one of the conditions which make for the production of a good brick and for good brickwork, on account of the facility of manipulation and easy, solid bedding which it affords; and should, therefore, as a builded brick, be considered a source of strength rather than of weakness. We are, of course, speaking of the ordinary-sized frog of the stock brick, for instance, not of the double frog, intended to reduce the cost of freightage. The whole question of brickwork requires overhauling, and in this, so far as the tests go, the Royal Institute of British Architects is conferring a benefit upon the British public.

F. WALKER.

THE CHEMICAL DEPARTMENT OF THE UNIVERSITY OF ABERDEEN.

SIR,—My attention has been called to a letter headed "Ventilation of Marischal College, Aberdeen," which appears in your issue of December 19, and in which the writer, Mr. William Key, says:—

"The Professor stated that it was admitted that these chemistry classrooms at this university are the finest in the world . . . ."

My actual statement was more modest.

All that I said was that one or two experts had inspected the new chemical department, and had expressed the opinion that it was "the finest they had seen."

So far from claiming that the laboratories were the finest in the world, I expressly said, in my opening address at the beginning of the present session:—"They will not compare with many of the palatial laboratories now erected on the Continent, especially in Germany." F. R. JAPP.

Chemical Department, University of Aberdeen.

LISKEARD CHURCH TOWER.

SIR,—Seeing the announcement in your columns that designs are invited for a new Tower at Liskeard Church, Cornwall, may I be allowed to state a few facts as to what has lately passed in connexion with the existing tower of this Church, so that any who think of competing for this work may know how matters stand.

Early in the present year I was asked to inspect and report upon the condition of the present tower. Before making my inspection I was told by some gentlemen interested that it was generally hoped that my report would be favourable to the removal of the tower, as a certain lady had left a considerable sum of money for its rebuilding if the work was undertaken before a stated date, otherwise the money was to go to Truro Cathedral.

I made a careful inspection of the old tower, and sent in my report on April 4, 1896. Now, sir, one would think that a report bearing on so vital a matter in the history of the parish as the retention or destruction of a tower that linked the present with a past of over 700 years would, at least, receive the careful consideration from those into whose hands the care of this ancient structure is temporarily placed. Some consideration it may have had, but the views expressed in the report were evidently not in sympathy with the wishes of the majority of the Committee. The report was not even acknowledged, no intimation was given me that the report had been considered, or acted upon in any way, nor was I further consulted in the matter; and not until hearing of the advertised competition for a new tower was I made aware of the serious step taken by the Committee. To many, one would think, the most ordinary courtesy would have dictated another course. But, needless to say, the report sent in was entirely adverse to the removal of the fine old tower, which, although it has been allowed to fall into a shameful state of dilapidation is, with its Norman details and carving, by far the most interesting part of Liskeard Church, and which, with careful restoration, would stand to hand on the Church history of this ancient borough for centuries to come. It is surprising that its destruction should ever have been contemplated, and it will be a crying shame if this ancient landmark of the Church in Cornwall is removed simply to satisfy the craving for something new, and the passing whim of a few local townsmen who by chance have the temporary stewardship of this tower.

GEO. H. FELLOWES PRYNNE.

THE NEW HOLBORN POST OFFICE.

SIR,—If not too late, I should like to suggest to the authorities a considerable improvement in New Oxford-street, and one that would secure a Government building an adequate façade.

It is proposed, I understand, to build a new West Central District Post Office, and a site has been partially cleared with that object. This is bounded, on the north, partly by New Oxford-street and partly by a little narrow bye street, Hyde-street; and on the west by Museum-street. The piece of Hyde-street might well be abolished, and the small triangle of houses—which will else stand in front of the Post Office—be cleared away. It consists of some six or seven shops, &c., only.

A fine frontage would thus be secured to the new building on New Oxford-street, extending from its eastern boundary to the corner of Museum-street; thus continuing the real line of New Oxford-street, and removing a somewhat stupid and very long break caused by the entering of Hyde-street into it in a very oblique direction.

A glance at the map, or better still, at the actual site, will, I think, show what a real improvement this would be. The Civil Authorities might well join in the scheme, and by setting back the line of houses on the west right up to the (very awkward)

angle of Shaftesbury-avenue, the throttling of the traffic outside Mudie's would be avoided, and the new building be well seen on approach either from east or west. The block of traffic opposite Mudie's is really becoming serious. C. H. BRODIE.

MORLEY PUBLIC BATHS COMPETITION.

SIR,—I enclose a copy of correspondence which has passed between myself and the Borough Surveyor, as it may be a useful warning to those who may wish to compete. It would seem, from the advertisement in your last issue, that the Borough of Morley is offering the nett sum of 15*l.* for sketch plans of Public Baths, the work to be carried out by some one who is incapable of designing it.

December 29, 1896. ERNEST HERBERT.

32, Bedford-row, London, W.C.,
December 24, 1896.

PUBLIC BATHS COMPETITION.

DEAR SIR,—Kindly send me particulars of above and plan of site as advertised, for which I enclose 10s. deposit, to be returned if the conditions are such that it is impossible to comply with them. If there is any doubt as to the successful competitor being employed to carry out the work, you can return my deposit without the particulars, &c.

From the wording of the advertisement, I should imagine that you have to pay the premiums out of the deposits forfeited, which does not seem a liberal treatment to offer to competitors.—Yours faithfully,

ERNEST HERBERT.

Mr. M. H. Sykes, Borough Surveyor, Morley.

Borough Surveyor's Office,
Town Hall, Morley,
December 28, 1896.

Re PUBLIC BATHS.

DEAR SIR,—I beg to acknowledge receipt of your letter of the 24th inst., together with postal order for 10s. As the Corporation cannot give a guarantee to employ the successful competitor to carry out the work, I return you your postal order as requested.—I am, dear sir, Yours truly,

M. H. SYKES,
Borough Surveyor.

Mr. Ernest Herbert,
32, Bedford-row, London, W.C.

The Student's Column.

SPECIFICATIONS.—I.

BEFORE commencing to write a specification the student should endeavour to obtain a clear comprehension of the object and uses of such a document, and then proceed to consider how he can best fit his work for its purpose. The primary object of a specification is to supplement and elucidate the drawings, so that the workmen who have to carry out his designs may completely understand the architect's intentions. It, therefore, especially deals with the quality of materials and workmanship, and describes the sizes and forms of those items which cannot be conveniently shown on the drawings. It may include a description of what is shown on the drawings, but, speaking generally, it is not advisable to repeat or attempt to repeat one document in another. Some things can be far better shown on drawings than described verbally in a specification, and the attempt to include in the latter what is already better expressed in the former, is liable to confuse rather than to inform the mind of the workman. Although the specification universally forms part of the documents on which the contract is founded, it should be remembered that the specification is rather for the use of the foreman either on the works or in the shop, than for the master builder in his office. The conditions of contract are therefore better omitted from the specification, and made a separate document, which can be kept in the contractor's office.

The predominant characteristic of a specification should be precision. Every item which it deals should be so clearly defined and explained that there can be no possible doubt as to what are the intentions of the architect in respect of every detail, and hence what is included in the contract. Precision can only become the characteristic of any particular specification through the exercise of that quality by the writer. He must therefore possess a thorough knowledge of construction, and be able in his mind's eye to see into the innermost recesses of every part of the building, and to follow the consecutive processes by which the work arrives at completion. He must have a competent knowledge of materials, so as to be able to express precisely the quality that he expects. He must know completely the full intentions of the designer in respect of every particular. The right man, therefore, to compile the specification is he who makes the design, and the practice of deputing this work to another, be he quantity surveyor or assistant, is one that is discreditable to any architect worthy of the name, and must result in a loss of efficiency, and often breeds future trouble out of all proportion to the relief that appears to come from shirking the initial duty. If he would attain precision, let the student be very chary of using terms of general but indefinite meaning, such as "best," "necessary," "sufficient," "proper," and the like, which are but too common in many specifications, and usually indicate clearly nothing but the ignorance or indolence of the writer.

Equipped with the necessary knowledge and the determination to be precise, clear and accurate, the student should look carefully through his drawings and jot down, as memoranda, the headings of the various items in each trade which he is to specify. Then he can take these memoranda and, after numbering them in the order in which he intends them to follow in the specification, proceed to deal with each item in turn. To facilitate reference, each item should have a marginal note or heading, and if the specification is a long one, it is worth while to make an index of these headings. It is advisable to adopt the same order, both of trades and of items in each trade, in all one's specifications; and it is just as well to adopt the order of trades usual in specifications and bills of quantities; whilst, for the individual items, as good an order as any is to arrange them, as nearly as may be, in the order in which they are executed. As materials have to be provided before work can be done on them it follows that in each trade a commencement will be made with a description of the materials for that trade. Then comes a general description of work, and following this the special items in proper order. Where a general requirement stands for all the items of a class it is well to place this general requirement before the description of the particular items, thus: "All frames to external doors to have iron dowels, &c.," should precede the detailed account of the various external doors. The adoption of this practice makes for brevity, and brevity, as far as is consistent with precision and thoroughness, is a desirable feature in a specification, rendering it easier for reference, and more likely to be thoroughly read and remembered.

Although the arrangement of the various items in a specification will naturally be grouped under the different trades, it is advisable not to follow such a division with the literal exactness observed in a bill of quantities, but rather to keep together the description of all the adjuncts of each part. Thus, for example, in describing a door, the linings, architraves, and ironmongery should be included. Indeed, it is quite possible to write a good model specification, totally ignoring the usual division into trades, and grouping the various items under headings of the various parts of a building, as walls, roofs, floors, ceilings, windows, doors, fireplaces, water supply, sanitary fittings, &c. In such a system the heading of "roofs," for example, would comprise a description of carpenter's work in the timbering, battening, and boarding; slater's or tiler's work; plumber's work in gutters, flashings, &c. The adoption of this system implies, of course, that there is one contractor only for the whole of the work, and that the Scotch practice of letting out the work in different trades to different contractors is not followed, but as the single contract system is practically universal in England, and sub-contracting is out of favour both with architects and trades unions, there is little advantage in favour of the older system of specifying by trades.

To facilitate reference between drawings and specifications, it is a good plan to number all the openings on the plans, doors, windows, fireplaces, &c. In this numbering no great attempt should be made to keep the sequence full. Let the doors begin with, say, number twenty-one, the windows with fifty-one, and fireplaces ninety-one, even if there be no more than, say, a dozen doors and a score of windows. The rooms of which there are no special names, as bedrooms, may be lettered bedroom A, bedroom B, and so on.

The student is now prepared to commence the actual work of writing his specification and will head it thus: "Specification of works required to be done in the erection of a *house* at
for in accordance with drawings
numbered 1 to prepared by Mr.
of the architect referred to in this
specification. January, 1897."

Then begin with

"PRELIMINARY AND GENERAL."

Under this heading include:—

Notices and Fees.—Give all requisite notices to Local and other Authorities, obtain all licences, and pay all fees.

Setting-out.—The contractor is to set out the whole of the works in accordance with the plans, and he will be responsible for the correctness of the setting-out, and is to amend the same if it shall be found by the architect to be incorrect.

Dimensions on Drawings.—Figured dimensions are, in all cases, to be taken in preference to scale, and large scale details to be followed in preference to small scale general drawings. In the event of any apparent discrepancy between the drawings, or between the drawings and this specification, the contractor is to ask for an explanation from the architect before proceeding.

Drawings to be Returned.—If this is desired, stipulate accordingiy.

Hoarding.—Specify what height of hoarding is required, with its fans, gates, planked footway, and rail, to be to the satisfaction of Local Authorities, and removed at completion. State whether advertisements will be allowed.

Roads and Footways.—State whether the contractor is to take up paving and form temporary roads or footways, and reinstate, or whether he is to pay Local Authority for doing the work.

Temporary Enclosure.—If it is desired to keep building operations within limited space, state how much of site is to be temporarily enclosed with post-and-rail fence, to be removed at completion.

Scaffolding.—The contractor is to supply all scaffolding and plant required for the works, but is not to bring on to the site any other building material or plant not required for these works.

Old Drains, Cesspools, &c.—Carefully search for and open all disused drains, cesspools, &c.; empty cesspools, remove drains, and fill up with concrete.

(N.B.—As this is a very speculative item, it is well to provide a definite amount of digging and concrete to be so used if required.)

Watching and Storage.—Supply all requisite watching by day and night for the whole of the building and works till the completion of the contract, also the requisite storage and safekeeping of all stoves and other fittings during and after delivery.

Water and Lighting. — Pay all charges for water and lighting required for the works during the erection of the building, and supply, alter, and remove, as may be required, all pipes and fittings, and pay fees for the necessary connexions. The contractor will be required, before receiving his final certificate, to produce receipts for water and gas.

(N.B.—This last clause is desirable to prevent the employer being dunned by water and gas companies after the completion.)

Attendance.—Each trade is to attend upon, cut away for, and make good after all others, and to perform all work in the nature of jobbing work that may be required. The contractor is to afford facilities to any other tradesman employed by the architect in the building, and to provide scaffolding and attendance as may be required.

Provisional Sums.—In all cases of provisional sums of money and of any specific quantities of work which are included in this specification, the architect shall be at liberty to direct the application of the sum or to deduct all or any portion as the case may require.

The amounts included in this contract as provisional sums are exclusive of contractor's profit, carriage and fixing, unless specially included.

(N.B.—Provisions are frequently a cause of trouble at the final settlement. Instead of the clause given, it may be stated that the p.c. amounts include a certain profit of 10 to 15 per cent. for the contractor, or that they are list prices, but this does not always save the trouble. The specification should define the basis on which p.c. amounts are to be treated, and the architect should adhere rigidly to the basis he lays down in his specification.)

Protection of Work and Materials.—Protect all materials and finished work from damage by weather, carelessness of workmen, or other cause, and make good any damage that may occur. This stipulation is to apply to materials and workmanship of any person employed by the architect as well as that of the contractor.

Latrines.—Provide latrines for the use of workmen, taking the necessary precautions to prevent same from becoming a nuisance; empty, remove, and disinfect with hot lime their site at completion.

Office.—If desired for clerk of works or architect, this should be specified with a stipulation that the contractor is to provide firing, light, and attendance, and remove at completion.

Sand and Gravel.—State whether the contractor is to be allowed to use this on the works, and whether or not he may remove any from site.

Curiosities.—A similar stipulation should be made.

Removal of Rubbish.—Remove and cart away all superfluous earth and rubbish as it accumulates and at completion, together with all plant and superfluous materials.

OBITUARY.

MR. DANIEL BRADE.—We regret to have heard, rather late in the day, of the death on December 11 of Mr. Daniel Brade, the architect who gained a reputation as the only English competitor placed among the successful twelve in the Milan Façade competition. Mr. Brade was born in or near Liverpool, and was articled in an architect's office there, and subsequently went to Sir Joseph Paxton's office for some years. He was in practice in London for two years, after which he bought a practice in Kendal, where he remained for twenty years. He was architect to Lord Bective, for whom he built a fine bridge, and also some churches. Since 1890 he had lived in London. Besides his success in the Milan Competition, he won gold and silver medals for two designs for the Victor Emmanuel memorial, and was second in the Leeds Municipal Buildings Competition. He was sixty-seven at the time of his death.

GERMAN ARCHITECTS RECENTLY DECEASED.—We regret to have to record the death of Dr. Paul Spieker, of Berlin, at the age of 71. Herr Spieker was Director-in-Chief to the Prussian Ministry of Public Works, and was hence the leading building official at Berlin; and for a considerable number of years he held the post of Technical Councillor to the Education Department. He was appointed Director-in-Chief at the Ministry of Public Works in 1891, and only retired last year. Besides the prominence obtained in his professional career we would add that his popularity was such as to make his resignation felt by all classes of officials throughout Germany. His geniality to the younger members of his profession was particularly noticeable. Of other prominent German building officials who have died in the course of the last month we have to record the death also of Baurath Boethke, who held a very high position on the military Board of Works; and of Oberregirungsrath Karl Busse, who was long associated with the various government building departments, and was a member of the *Akademie für Bauwesen.*

GENERAL BUILDING NEWS.

LUNATIC ASYLUM, DENBIGH.—Extensive additions are about to be made to the Lunatic Asylum at Denbigh, the contract for which, exceeding 50,000*l.*, has been placed in the hands of Mr. Samuel Warburton, of Miles Platting, Manchester. Messrs. C. O. Ellison & Son, of Liverpool, are the architects.

MUSIC HALL, SALFORD.—A music hall, to be called the Empire, capable of accommodating 2,500 persons, is to be erected at Salford. Mr. Frank Matcham has been retained as architect.

PARISH CHURCH, WOMBWELL, YORKSHIRE.—The foundation stone of St. Mary's New Parish Church, Wombwell, which is to replace an ancient dilapidated structure, was laid on the 21st ult. by Viscount Halifax. The architects are Messrs. A. R. Garland & C. Hadfield, of Sheffield; Mr. G. Webster, Sheffield, is the contractor; and Mr. F. Cook, clerk of the works. The new church will afford accommodation for 750 worshippers.

POST-OFFICE, TIPTON, STAFFORDSHIRE.—On the 21st ult. the new post-office at Tipton was opened. The building was designed by Mr. Tanner, H.M. Office of Works, Mr. J. Mallin, Churchfield, West Bromwich, being the builder, and Mr. Atkinson clerk of works.

RESTORATION OF THE PARISH CHURCH, ALRESFORD, HANTS.—The Church Restoration Committee, Alresford, have obtained from Sir Arthur Blomfield & Sons plans for a scheme of restoration, which have been approved by the committee.

NEW CHAPEL, WHITECHAPEL INFIRMARY.—The new chapel at the Whitechapel Infirmary was opened recently. The chapel has been adapted from a disused ward, at a cost of £800, from designs by Mr. Capell, architect, and is intended to accommodate 150 persons. The contractors were Messrs. Jones & Groves.

BOARD SCHOOLS, BARKING.—The schools erected by the Barking School Board on a site near North-street, were opened by Major S. Glenny recently. Mr. C. J. Dawson is the architect. The schools are on the class room and central hall principle, in three stories. The total accommodation is for 1,714 children, divided as follows:—Infants, 674; girls, 520; and boys, 520. The external walls are of blue, yellow, and buff terra-cotta bricks, while the internal walls are of glazed primrose bricks. The cost of the whole work has been 21,771*l.*

OPERATING THEATRES, ST. GEORGE'S HOSPITAL, LONDON.—On the 23rd ult. the new operating theatres in connexion with St. George's Hospital, Hyde Park-corner, were opened by the Duke of Cambridge. The suite of rooms embraces the large (east) theatre, which has been remodelled, and the small (west) theatre, which is entirely new, two chloroform rooms, one in connexion with each theatre, a sterilising room, and other necessary adjuncts. The whole of the work has been carried out under the personal supervision of the architect, Mr. H. Percy Adams.

FEVER HOSPITAL, FALKIRK, STIRLINGSHIRE.—On the 22nd ult. a new fever hospital was opened by the Eastern District Commitee of Stirlingshire. The new hospital, which is situated to the west of Camelon village, occupies a site extending to about three acres. The building, which cost about 7,500*l.*, embraces administrative, scarlet fever, enteric fever, and laundry blocks, besides two observation wards. There are twenty-four beds in all, and sufficient cubic space has been reserved to allow of further bed accommodation in case of emergency. The architects are Messrs. A. & W. Black, Falkirk.

LYRIC HALL, DUBLIN.—It is stated that plans of the Grand Lyric Hall, Dublin, have been lodged with the City Architect. Mr. W. H. Byrne, architect, has designed the hall.

CHURCH, CWM PARK, GLAMORGANSHIRE.—The Bishop of Llandaff consecrated on the 22nd ult., at Cwm Park, St. George's Church. The church, which is situated in the centre of the village, accommodates more than 400 worshippers, and comprises a chancel, nave, south aisle, porch, and tower over 60 ft. in height. The architect is Mr. George E. Halliday, the Diocesan Surveyor for Llandaff. The walls are composed of native stone, while hard Doulting stone is used for the window tracery and other dressings; the hammer-beam roof is of pitch pine. The internal face of the walls is of pointed rubble work. The pulpit and font are of green Bridgend stone. The reredos is of polished pink alabaster, carved. The contractors were Messrs. Knox & Wells. The church is lighted by electricity.

MUNICIPAL BUILDINGS, HYSON GREEN, NOTTINGHAM.—The Mayor of Nottingham (Ald. E. H. Fraser) opened the new buildings at the junction of Radford-road and Gregory-boulevard, Hyson Green, on the 22nd ult. The buildings occupy a narrow site with a frontage of 320 ft. to the Gregory-boulevard, and are set back a distance of some 20 ft. from the thoroughfare. The charge-office and inquest-room above command a view of both the Boulevard and Radford-road. The buildings are of red brick with stone dressings, and have been erected by Mr. J. Adams, of Nottingham, to the plans of Mr. Arthur Brown, the Borough Engineer, at a cost of about 7,000*l.*

PROPOSED NEW THEATRE, ABERDEEN.—A syndicate has acquired from the Town Council of Aberdeen, by way of perpetual feu, a piece of ground with 110 ft. of frontage and 160 ft. of depth, on the east side of Rosemount Viaduct. It is proposed to erect on the site a theatre capable of accommodating over 2,000 persons. The building will be fireproof throughout, the pit resting on arches fronting Upper Denburn, a street running under the viaduct at a lower level, but all the entrances will be from the viaduct. The new building will be of granite, and Messrs. Harper & Sutherland, Aberdeen, will act as architects for the syndicate.

BUILDING TRADES, GLASGOW.—Trade generally in all branches of business in Glasgow during the past year has been encouraging, and fully maintained the best anticipations, and presents indications of a reassuring character for the new year. The electric lighting branch of business has been fairly brisk throughout the year, having received a slight impetus owing to reduction (long promised) in the price of the electric current supply from the Glasgow Corporation.

BUILDING TRADES, LEICESTER.—The past year has been one of the best experienced for a long time past in the various trades connected with building operations in Leicester. Indeed, so busy have all sections of that industry been, and continue to be, that the difficulty is not to find work for the men, but men to do the work. Taken all round, the building trades are probably in a better position than any other in the town at the present time, and the outlook is still a bright one. Of course, the advent of such an immense undertaking as the M. S. and L. new line of railway has had a great deal to do with stimulating enterprise in the direction of building works, although it cannot be said that these have been confined to any particular part of the town. The clearing out of some of the older parts of the borough necessitated the erection of many new cottages as well as new business premises. As would naturally be expected, it was in the outlying districts of the town where the greatest activity in building operations was to be found. A noticeable feature of much of the new building work of the past year or two is the free use which is made of terra-cotta for frontages. Manufactured stone and cement concrete are also largely used, the last-named being, of course, a local production. Just now, and for some time past, empty houses in Leicester have been conspicuous by their absence, a fact that is closely associated with the exceptional activity in the building trades. In almost every direction new working-class dwellings may be seen in course of erection.—*Leicester Post.*

BUILDING TRADES, EDINBURGH AND DISTRICT.—Not for many years has more activity been manifested in the several branches of the building trade than during the past year. One of the largest of the undertakings at present on hand, the rebuilding of the Waverley Station and the erection of the North British Railway Hotel, has not yet reached the stage when the mason and the joiner with their coadjutors conie fully into play; but when the ground has been properly cleared for them the trade will undoubtedly witness a "boom." This, at any rate, is the opinion of those who know how numerous are the new schemes which in the next year or two will be launched, the North British reconstructions, formidable as they are, being only among several which, should they be proceeded with simultaneously, will tax the resources of builders to the utmost. Thus, the Caledonian Railway Company, we understand, are seriously contemplating the erection of a hotel above the fine station at the west end of Princes-street, which they recently completed. Then, the Corporation are preparing for the construction of a new fever hospital at a minimum outlay of 250,000*l.*, while the cabling of the streets will necessitate a series of new tramway stations at various points in the city. Another big undertaking will be the building of the Usher Hall, when the Town Council have finally decided where Mr. Usher's gift shall be placed, and there is besides the re-erection of the Council Chambers, or at least such a structural re-arrangement as will be almost tantamount to a re-erection. The year has seen a further extension of the housing capacity of the city, especially in the Morningside, Merchiston, and Murrayfield districts. Altogether the year has not only been an exceedingly prosperous one for the most influential trade in Edinburgh, but the prospects for the coming year are of the brightest. There have been no wage disputes during 1896. The joiners were on strike for a fortnight pending the re-arrangement of their working rules. The matter was compromised by concessions on both sides. The standard rate for masons fixed by the Master Builders' Association, in conjunction with the men, stands at 9d. per hour, but this is by no means the maximum which has been paid, many employers granting 9½d., and even 10d. The joiners' rate remains at 8½d., and has been seldom exceeded; and plasterers 9d., about one-third receiving a halfpenny more; bricklayers, 9½d. to 10d. per hour; and lathsplitters, 9d. per hour. The number of masons in Edinburgh is under 2,500—2,300 of the number are paying members of the Edinburgh Lodge of the Operative Masons Association of Scotland—and there are between 1,100 and 1,200 joiners employed in the city. It may be mentioned that a movement is on foot to start in Edinburgh a builders' exchange similar to that which has worked so successfully in Glasgow, and Colonel Bennett, of the latter city, will shortly deliver a lecture on the subject.—*Glasgow Herald.*

THEATRE, RUNCORN.—The foundation stone of the New Runcorn Theatre was laid by Mrs. Caddick recently. The theatre has three main entrances from Front-street. The auditorium is 34 ft. wide by 52½ ft. in depth. The pit floor has a slope of 2½ ft. from back to proscenium wall. The circle on the first tier has a seating for 240, and is also provided with two private boxes. The centre part of the circle is fitted up with 100 tip-up chairs, the side seats being continuous; on this tier also are provided ladies' and gentlemen's cloak rooms, lavatories, &c., complete. The gallery is on the next tier, and will accommodate about 500. The stage is 37½ ft. wide by 31 ft. in depth. There are six dressing-rooms. There are also provided refreshment bars to pit and circle, the latter being 28½ ft. by 21 ft. For the heating of the building and dressing-rooms, hot-water pipes are used, on the low-pressure system. The architect is Mr. William S. Shell.

BAPTIST CHURCH, FALKIRK.—A new Baptist Church is in course of erection at the corner of Weir-street and Orchard-street, Falkirk. The new church, which is in the Gothic style, has accommodation for 320 sitters, with ladies' and gentlemen's rooms behind, which can be thrown into one so as to form a hall. Mr. G. Deas Page, Falkirk, is the architect, and the cost is 2,000*l.*

RESTORATION OF GREAT HARROWDEN PARISH CHURCH.—The ancient Parish Church of Great Harrowden, dedicated to All Saints, which has recently undergone restoration, was re-opened on the 10th inst. The architecture of the church is Early English, consisting of nave with clearstory chancel, north aisle, north porch, vestry, and square embattled tower, with four crocketted pinnacles, containing bells and clock. It was found necessary to restore the nave and north aisle. The roof and floors were in a dilapidated condition, and the woodwork was decayed. The old-fashioned box pews have been removed, and modern oak seats, with traceried ends, have been placed in the church, and are erected on a wooden floor. Ketton stone has been laid in the passages and aisles, and the old memorial slabs and grave stones have been replaced. In the interior of the nave a new oak pulpit, on a stone base, has been erected, as well as a new reading desk and a new font. The ancient Perpendicular wooden screen crossing the chancel has been carefully restored with a vaulted canopied cornice, enriched by a screen. New roofing of pitch pine has been placed over the nave and aisle and covered with lead as previously. The walls in the interior have been replastered, and the roof, parapets, walls, and stone seats of the north porch have been restored, and new

oak doors have been placed at the north and west entrances. The stonework of the windows and buttresses have also received attention, whilst steps have been taken to protect the base of the walls from wet by providing surface drains. This restoration has cost between 1,100*l.* and 1,200*l.* During the progress of the work fragments of very interesting wall paintings have been found, but they were so fragile, and the plaster so rotten, that it has been possible only to retain the one over the chancel arch and a portion of that on the east end of the north aisle. The arcades have been exposed. They are of Early English character of quatrefoil form, with disengaged columns. Messrs. Talbot Brown & Fisher have been the architects, and building operations have been carried out by Mr. G. Henson, of Wellingborough.—*Northampton Herald.*

BUILDING TRADE IN FRASERBURGH, N.B.—There has been another year of very considerable activity among the building trades in Fraserburgh. A great many new houses have been erected. Extensive improvements have been effected on existing buildings, and other work of a kindred nature has kept all branches very fully employed. The great want of house accommodation, nevertheless, continues to be felt keenly, and the need of still further enterprise in this respect is great.

BUILDING TRADES, LEEDS.—Paralysed though it was for a period of twenty-two weeks, the Leeds building trade at the end of 1896 may fairly be described as in a very healthy condition. The outlook is exceedingly hopeful, all the more so because of the absence of that feeling of unrest and foreboding of disputes which had marked the beginning of some previous years. The unfortunate dispute of 1896 began on May 1; it ended on September 19; and, perhaps, each side felt that in the settlement they had gained some advantage. The bricklayers got an advance of a halfpenny, which made their pay ninepence an hour; the labourers were granted a farthing advance, with the promise of another farthing on September 19 next. On the other hand, the alteration in regard to walking-time, which substituted a two-mile radius from City-square for the fixed points which had previously controlled the payment, was regarded by the masters as a move in their favour, especially in view of the rapid rate at which building work was being carried on in the outlying parts of the city. The employers also believed that the adoption of certain new rules would assist them in their trade. The actual condition of the trade has not been better for years. There is work in almost every quarter. Among the larger undertakings are the Manston Hospital, the banks of Messrs. William Williams, Brown, & Co., the National Provincial Banking Company, and the Yorkshire Banking Company. In New Briggate the principal work is the new double arcade, and in Briggate the re-erection of the Buck Inn. Incidentally it may be mentioned that a great deal of alteration to public-house property has been effected. The rate at which dwelling-houses of all kinds, including the back-to-back class, are being erected is a satisfactory indication of the prosperity of the city. The Building Clauses Committee of the Corporation are said to be passing more plans than they have previously done in a similar period, the chief development being in the direction of Kirkstall-road and Burley Hill, and also in the neighbourhood of Roundhay-road.—*Leeds Mercury.*

BUILDING TRADE, PETERHEAD.—The building trades in Peterhead have been busy during the year. More new houses have been put up than last year; and there has been much more work obtained on structural alterations of houses. In addition, the work outside the town has been greater than usual, not a few masons, joiners, slaters, and plumbers having found lengthened employment in connexion with the erection of station houses for the new Cruden railway. In fact, the joiner trade was so promising in the summer time that the men demanded an increase of wages. The masters agreed to increase the standard rate to 6½d. per hour, which is the highest wage that has been paid in the joiner trade locally for a considerable number of years.—*Aberdeen Free Press.*

BUILDING TRADE IN DUNDEE.—To the building trade in Dundee the year just closed has from beginning to end been characterised by almost unbroken prosperity. It opened with the brightest prospects. A number of large undertakings were on hand, with others in view, while the boom in tenement building, although it had to some extent abated, had still left an enormous amount of this class of property in the hands of the builders. Thus throughout the year there has been no lack of employment in any of the branches of the building trade. Indeed, so far as masons are concerned, the difficulty has rather been in a scarcity of men, and no relief could be obtained from other centres in Scotland, where trade has been equally brisk. The only serious trouble was the strike of hewers at the end of May for an increase of ½d. per hour in their wages. Their action brought about a complete stoppage of building operations in the city, but after a struggle lasting for a month or five weeks the men returned to their employment on the old terms. The rate of wages has therefore remained unchanged during the year, viz., 9d. per hour for builders, and 8½d. per hour for hewers. The demand for houses of three rooms has been slack. In many parts of the city, too, there are numerous empty flats of four and five-roomed houses, accounted for partly by the fact that many people who were formerly content with dwellings of this kind in the city are finding their way to suburbs like Downfield, Wormit, or Newport, and particularly the two last-named, with which there are cheap and easy means of communication. Thus year by year it is becoming increasingly evident that Dundee has been over-built with dwelling-houses. Judging by present appearances, there will be much less tenement building in 1897 than there has been for several years past.—*Dundee Advertiser.*

BUILDING TRADE, INVERNESS.—The year 1896 has commercially been one of the most prosperous in Inverness during the last forty years. The opening up of the Highlands by the introduction of railways gave a boom to the building and other trades, the effects of which were felt for many a day. And now once again the near prospect of the opening of the new through line from Inverness to Aviemore, and the almost certain passing of a bill in favour of either one or other of the companies for the construction of a line from Inverness to Fort Augustus, with a through connection with the Invergary line and the West Highland to Glasgow, have set builders and speculators to the work of preparing for the great increase of traffic which they confidently expect will follow the completion of these great undertakings. The growth of the town in recent years has been remarkable.—*Dundee Advertiser.*

BUILDING TRADE. HALIFAX.—In the stone and building trades in Halifax there is a consensus of opinion among those engaged that the year has been a busy and a satisfactory one. The stone-quarrying trade has had a very favourable year. Throughout the twelve months the demand has been continuously steady and large. The exports to Germany have been above the average, and the consignments to London have been fairly large, whilst local requirements have been heavier than usual. For flagstones the demand has with difficulty been met. All sections of the building trades have experienced a fairly busy year. The erection of cottage property on the outskirts, especially in the western district, has been more extensive than usual.

BUILDING TRADE, YORK.—The building trade in York has been very active during the year. Plans for about 540 villa residences, houses, and cottages have received the approval of the Council. Plans have also been approved for the construction of twenty-four new streets and back roads in Haxby-road and Fulford-road districts, showing sites for 300 or 400 houses; also for six new hotels or public-houses. Several large structural alterations to business premises have been approved, and there have been many instances of the conversion of houses into shops or the modernising of existing windows.

SCHOOL, AULDEARN, NAIRN.—A new school has just been opened at Auldearn. The new building was erected at a cost of 1,275*l.*, and 277*l.* for the transformation of the old school into a teacher's dwelling-house. The school will accommodate over 200 scholars. The contractors were:—Mason, Mr. Thomas M'Donald, Inverness; carpenter, Mr. J. Grigor, Auldearn; slater, Mr. Gray, Inverness: plumber, Mr. F. Wink, Nairn; plasterer, Mr. Campbell, Nairn; painter, Mr. M'Intyre, Nairn. The architects were Messrs. Reid & Wittet, Elgin.

SANITARY AND ENGINEERING NEWS.

UNDERCLIFF DRIVE FOR BOURNEMOUTH.—The Bournemouth Corporation appear at last to be seriously taking into consideration the question of an undercliff drive and the preservation of the cliffs in the Bournemouth Bay, and at their meeting on the 30th ult. they instructed Mr. F. W. Lacey, their Borough Engineer, to be prepared with full particulars of his scheme. The ground landlord, Sir George Meyrick, and the London and South-Western Railway Company have promised to contribute towards the probable cost, which is estimated at about 60,000*l.* Mr. Lacey's scheme consists of a concrete wall about 20 ft. wide at the base, and constructed at an incline of about 2 in 1, and finished at the top with a stone coping, and terminating at the bottom well into the stratum, generally known locally as blue clay, at a depth of at least 2 ft. below low-water mark. He is of opinion that this form of wall as a sea defence is greatly superior to the vertical wall proposed in the premiated schemes in the competition, which would probably not resist the attacks of a single heavy storm. The scheme provides for a carriage-drive and a promenade from Alum Chine to Boscombe Pier, about 13,000 ft. long. The wall would be broken by flights of steps, giving an aggregate length of 4,400 ft., and the wall would be otherwise divided into bays by circular projections, on which would be placed shelters or seats. These projections would very much help to prevent the washing away of the sand, should there be a tendency to scour. There would be ramps at Boscombe and Bournemouth Piers, Durley Chine, and Alum Chine for access to the beach, for the purpose of bathing machines, boats, &c., as may be required. The drainage of the cliffs would be effected by means of a system of small drains emptying into shafts sunk at the back of the cliffs, in connexion with adits driven into the face of the cliffs, which would again empty on to the beach through outfall-pipes passing under the proposed drive. The present state of the cliffs in Bournemouth Bay is such as to render some scheme of the kind highly desirable, as they are so constantly changing and crumbling that an accessible path to the beach one year may be found to have nearly disappeared the next year.

NEW SEWERAGE SCHEME, ABERDEEN.—Mr. William Dyack, Borough Surveyor, recommends a new sewerage scheme for Aberdeen, the estimated total cost of which is 160,000*l.*, exclusive of any allowance as compensation for way leave or surface damages. Mr. Dyack's plans provide a complete scheme for the interception and disposal of the sewage from the whole of the city, with two main outfalls—one in deep water in the sea at Girdleness, and the other beyond the bar at the mouth of the river Don—and two secondary outfalls—one at Abercrombie's Jetty in the navigation channel of the harbour, and the other near Victoria Bridge across the river Dee. The works recommended to be executed at once would cost 75,700*l.*, and the works—low-level sewer, high-level sewer from Old Ford-road to Skene-street, storm outfall at Esslemont-avenue, and storm culvert at Hutcheon-street—which are required without delay, would cost 34,090*l.* The scheme includes works for the purification of the Don, and as a means of stopping the pollution of their burns, which unite and flow along the Old-town Links into that river, Mr. Dyack recommends the discontinuance of the process of sewage irrigation on the lands of Spital.

BRIDGE, REDHEUGH, NEWCASTLE.—The Redheugh Bridge, which has for some twenty-five years formed the principal means of communication between the western portions of Newcastle and Gateshead, is about to disappear. The present bridge had as engineer the late Sir Thomas Bouch, who designed the ill-fated Tay Bridge. The new one by which the Redheugh Bridge Company are about to displace it has been designed by Messrs. Sandeman & Moncrieff, of Newcastle.

WATER SUPPLY WORKS, HAVERHILL, EAST ANGLIA.—Col. A. G. Durnford, R.E., an inspector of the Local Government Board, recently held an inquiry at Haverhill Town Hall with reference to an application by the Urban District Council for permission to borrow 2,000*l.*, a further loan on works of water supply. Mr. T. Cockerill (Engineer) attended.

PIER, BANGOR, COUNTY DOWN.—A new pier has been constructed at Bangor. The new pier is 790 ft. in length, and the breadth is 40 ft. The work, which was carried out by the firm of H. & J. Martin, Limited, Belfast, was commenced over two years ago. The work has been executed under the supervision of Messrs. Martin's engineer, Mr. Wheeler, the foremen on the works being Messrs. Robert and Alfred Pippin.

WATERWORKS, LISBURN, IRELAND.—The formal opening of the new waterworks at Lisburn took place on the 23rd ult. The main features are—first, the reservoir, which is designed to give a population of 15,000 twenty-five gallons per head per day, and hold a supply for 122 days. The reservoir is formed by an embankment some 1,200 ft. in length. The catchment area above the reservoir is about 460 acres. The area of ground enclosed for the reservoir is 22 acres. The water is drawn off through valves into a cast-iron stand-pipe, which is in the centre of a cast-iron water tower standing about the middle of the embankment. The supply of water comes from springs mostly on the hills above. There are two filter tanks constructed of concrete, each 102 ft. by 69 ft., giving an area of filtering material sufficient for the work. The filtering material is broken stone, gravel, coarse sand, and fine sand on the top. At the end of the filters there is a clear water tank 82 ft. square, 10 ft. deep, where the water can be stored as it comes from the filters. This tank is constructed of concrete, and covered with the same material. The engineer of the scheme is Mr. Lanyon, M.Inst.C.E. The resident engineers were Mr. D. Sims, M.Inst.C.E., who died in January last, and Mr. A. M. Pearce, A.M.Inst.C.E. The contractors for the work were Messrs. H. & J. Martin (Limited), who were represented at the works by Mr. J. Fleming and Mr. J. Alexander.

ELECTRIC LIGHTING NEWS.

ELECTRIC LIGHT, BRAY, IRELAND.—Mr. R. O'Brien Smyth, C.E., Engineering Inspector of the Local Government Board for Ireland, held an inquiry on the 23rd ult., in the Town Hall, Bray, with reference to the proposed extension of the Bray Township Electric Light Works, for which the Commissioners, acting as Urban Sanitary Authority for the district, had applied to the Local Government Board for their sanction to a loan of 5,450*l.* Sir Henry Cochrane, D.L., J.P., Chairman of the Bray Commissioners, was present, as were also the Town Clerk (Mr. Patrick M'Donnell), and Mr. George Marshall Harris (Township Electrical Engineer).

STAINED GLASS AND DECORATION.

WINDOW, PARISH CHURCH, GOSBERTON.—A new memorial window has been placed in the Parish Church of Gosberton, Lincolnshire. The subject of the window is "The Walk to Emmaus,"

and it is from the studio of Mr. T. W. Camm, of Smethwick, Birmingham.

STAINED-GLASS WINDOW FOR BUENOS AYRES.—The window intended for the Church of St. Andrew, Buenos Ayres, and executed by the firm of Messrs. D. & W. Guthrie, Glasgow and London, from the cartoons of Mr. David Gauld, is a perpendicular five-light treatment. The entire supervision of the work has been entrusted to Mr. John James Burnet, A.R.S.A.

WINDOW, ST. GEORGE'S CHURCH, EDINBURGH.—A feature of the improvements now being carried on in St. George's Church, Edinburgh, is the filling with stained glass of the large window of three divisions looking to the west. By somewhat enlarging the height of the central opening, sufficient space has been obtained for the representation of the subject of the Ascension. The composition divides itself into two groups. The upper one, elliptical in its main lines, consists of our Lord, in the act of blessing, surrounded by a group of angels. A band of cherubs and cloud forms of varied rubies separate the upper from the lower group, which latter consists of Apostles and the Virgin Mary; some kneeling, others standing, but all with upturned faces concentrated on the ascending figure. The side spaces are filled with classic ornament upon a coloured ground, the emblem of the burning bush and a shield bearing the Cross of St. George forming central features. The window was executed under the direction of the architect, Mr. Leadbetter, at the studios of Messrs. A. Ballantine & Gardiner, Edinburgh.

FOREIGN.

FRANCE.—M. Homolle, Director of the French School at Athens, has been re-appointed for a new period of six years.——In order to give more time for the works for the 1900 Exhibition, it has been decided that the Old Salon this year will open not on the 1st of May as usual, but on the 20th of April, and will be closed on the 8th of June, immediately after which the demolition of the building will commence. Where the exhibition will be held for the next three years, until the new Palace is at their disposal, is not yet known; a memorial has been addressed to the Fine Art Department on the subject.——Extensive works are being undertaken for the improvement of the Gare de l'Est, which will become one of the finest railway stations in Paris. Twenty million francs are to be spent on the work.——The works for the completion of the Avenue Ledru Rollin, connecting the Place Voltaire with the Seine, are to be commenced early this year.——An International Exhibition, in which industrial art will be largely represented, will be held at Lille, in the Palais Rameau, in April.——The restoration of the old church of Notre Dame-de-Joie, at Pontivy, has been completed by the construction of a stone spire. The work has been carried out under M. Lemoine, architect, of Lorient.——The Municipal Council of Paris has resolved that M. Bartholomé's "Monument aux Mortes" shall be erected at Pére Lachaise according to the original design, which it had been proposed to modify on grounds of economy.——The death is announced, at the age of 30, of a young architect, M. Henri Collet, pupil of Laloux. He had obtained the diploma of architect in 1893, and was considered to have a future before him.

GERMANY.—We have much pleasure in recording the fact that the title of an honorary professor has been conferred on Herr Bruno Schmidtz, in connexion with his services, and the various monuments to Emperor William I. which have been executed from his designs.——Of competitions open to sculptors one of the most interesting is at present a memorial to Helmholtz. The subject has been open to a general competition amongst sculptors, and is now being treated in limited competition by the sculptors, Messrs. Hatter, Jarneusch, and Lessing. The memorial is to be placed in the forecourt of the Berlin University.——The new City Architect of Berlin—Herr Ludwig Hoffmann—will have sufficient occasion to make his post a most prominent one; and the Municipality has already voted 7,500*l.* to enable the preliminary work for the proposed local museum to be taken in hand. Herr Hoffmann has promised to have his sketches ready early in spring.——The Schinkel prize and travelling studentship will next year be awarded to the most successful design for a town hall, and the Civil Engineers' theme for a similar prize, offered by the *Architekten Verein*, is for the best plan of a harbour.——The Prussian Royal Academy—the presidential chair of which is now being held by an architect, Professor Ende—has offered a valuable Government prize and travelling studentship for architectural students. The value of the prize is about 150*l.*, and the premium will be awarded to the candidate who shows the best designs of any subject he may wish to treat, or drawings and photographs of work he has executed.——The German Budget contains an item of 3,000*l.* to facilitate the research work on Roman remains in Germany; about 10,000*l.* has been granted by the Government with this view during the last five years.——The public advertisement—or poster—appears to be becoming the subject of considerable interest at Berlin, as there has been a special exhibition of posters in the Arts and Crafts Museum.——The *Centralblatt der Bauverwaltung* publishes some further details as to the training requirements of Fire Brigade officers, who are now enabled to undergo a systematic course of instruction at the headquarters of the Police Fire Brigade. Knowledge of building materials, construction, &c., is considered essential for the candidates for commissions.——An interesting series of controversial articles on lightning conductors is at present appearing in the *Centralblatt der Bauverwaltung* (published by Messrs. Ernst & Sohn, of Berlin). We shall in due course comment upon the controversy and the results arrived at.—— The number of students attending the Royal Technical College at Berlin has now nearly reached 3,000 The buildings at Charlottenburg are now over-filled, and it will soon be necessary to add to the accommodation. Nearly 600 of the number are students of architecture.——Among the many public works in hand at Breslau a new prison has lately been completed at a cost of nearly 100,000*l.* It comprises a separate building for male misdemeanants, and another for female misdemeanants, together with the various offices and tenements for the officials. There are cells for approximately 400 male and 300 female prisoners.——A competition for sculptors has been decided at Dresden for a Bismarck monument; the first premium of 150*l.* has been awarded to Herr Werner Stein.——A competition has been opened for the designs of a new City Hall at Leipzig, and premiums of the value of 600*l.*, 400*l.* and several minor ones will be given. There will be a committee of assessors, comprising seven architects and two laymen. Among the names of those on the committee we notice that of Professor Wallot of Dresden.——The municipality of Hanover has also decided to open a limited competition for the design of a new town hall, the cost of which is limited to 225,000*l.* The competition seems to be arranged on very practical lines, as each competitor who is invited will receive a fee of 200*l.*, whilst the successful design will apparently procure the commission. The limited competition is the result of an open competition held some time back.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS—Mr. T. Batterbury, hitherto practising as architect at 29 John-street Bedford-row, has removed his offices to Imperial Chambers, 47, Chancery-lane.——Messrs. D. Campbell & Son, Surveyors, have removed to 4, Finsbury-circus, their old offices at 69, Finsbury-pavement having been taken by the City and South London Railway Company for a station——Messrs. T. & W. Farmiloe, of Rochester-row, Westminster; Nine Elms, and Mitcham, S.W., have converted their business into a private Limited Liability Company. No shares will be offered to the public, and there will be no change in the management.——Mr. J. T. Passmore, estate agent, of West Kensington, has taken into partnership Mr. H. J. Cookes, formerly with Messrs. Debenham, Tewson & Co. The business will be carried on at Avon Lodge, West Kensington, under the style of "Passmore & Cookes."——The partnership between Messrs. James Woodward & Rowley, sanitary earthenware manufacturers, Swadlincote, near Burton-on-Trent, has been dissolved by mutual consent. The business will be carried on by Mr. S. H. Rowley, managing partner for twenty-three years in the old firm, whose works are situated near Swadlincote station.

LIFTS, HALIFAX INFIRMARY.—The Committee of the Halifax Union have decided to adopt electricity for working the lifts at their new Infirmary. The work, consisting of six passenger lifts and two service lifts, with all motors and accessories, has been placed in the hands of Messrs. Easton, Anderson, & Goolden, Limited, of Erith.

NATIONAL REGISTRATION OF PLUMBERS.—A deputation from the District Council of the National Registration of Plumbers waited on Mr. Bryce, M.P., recently at the Grand Hotel, Aberdeen, for the purpose of enlisting his sympathy and support in connexion with the Plumbers' Registration Bill. The deputation consisted of Professor Matthew Hay, President of the Council; Mr. A. B. Robertson, master plumber, Vice-President; and the following members of Council:—Mr. J. F. Anderson, Mr. William Garden, operative, and Mr. R. G. Wilson, architect. It was pointed out that the chief object of the Bill was to confer additional safeguards on the public health by enabling persons employing plumbers to select, when they desired to do so, those who had given evidence of their qualifications for plumbers' work. The Bill, it was also mentioned, did not contemplate any monopoly, and did not interfere in any way with the rights of non-registered plumbers, but prohibited them from representing themselves to be registered. Mr. Bryce, in reply, expressed his sympathy with the object of the deputation, and promised to give the Bill his most attentive consideration.

GUILDHALL ALTERATIONS, WESTMINSTER.—The dispute with the builders over the alterations to the Guildhall, Westminster, the meeting place and offices of the Middlesex County Council, is in a fair way to be settled. Messrs. Higgs & Hill, the contractors, sent in a bill for 1,349*l.* over the contract price and extras agreed to by the Council, on the ground that there had been extra work in connexion with some old walling that was made of stone rubble and not brick, as they asserted it had been represented to them. On the other hand, the County Council put in a claim against the contractors of nearly 1,300*l.* for penalties, and then referred the matter to the County Surveyor as arbitrator under the contract. The contractors objected to the arbitrator, and wished the reference to be to an independent engineer, and the County Council refusing this, the contractors issued a writ for 2,972*l.* 3s. 10d., which they said was owing to them. Finally an offer has come from them that they will withdraw the claim for extra work if the County Council also waive a claim of 402*l.* for expenses. The Council has agreed to the terms, and a dispute which has lasted for more than two and a half years will be settled.—*Hornsey Journal.*

ECCLESIASTICAL DECORATION.—On the 22nd ult., in the studios of Messrs. Stephen Adam & Son, 199, Bath-street, Glasgow, Mr. Adam, sen., delivered a lecture to the Glasgow Ecclesiological Society. It was, he said, in continuation of one on "The Methods of Mediæval Glass-staining," which he gave before a meeting of the Society in Park Church in February, 1894, and which was published in the transactions of the Society for 1895. Having briefly recalled what was said then on the subject, he went on to refer to lectures on ecclesiastical decoration to which he said he had lately listened. While these had given him pleasure they did suggest a little that this art of his (the lecturer's) should, to put it mildly, take a back seat, that white windows and enriched walls should be desirable features in the perfect church. There was much of truth in what was said, but he asked—But for the mellowed and enriched light which stained glass was so capable of giving, how would the modern over-stencilled kirk interior look? Verily, his art cloaked many sins. The mural decorator had much to thank the glass stainer for; so had the architect. Many criminalities in colour, form, in cheap chiselling, bad as it often was, acquired borrowed plumes, subdued richness, by the glorified light of the glass staining art. Genuine work, he continued, could only be produced by men of training who had studied what was good in early work and had the intuitive sense of colour harmonies. The lecturer went on to show wherein and to what extent the modern development of the art had succeeded in catching the spirit of what was purely mediæval glass-staining, where and how in later times it failed to do so, and consequently declined as an art, and how in recent years a healthy Renaissance had sprung up among them like an exhilarating sea breeze which would resuscitate in modern forms the splendour and glory of earlier work. His hope for the improvement of modern church decoration lay in the restoration of their ancient trade guilds. The lecturer also gave practical illustrations of the process of glass-staining. At the close Mr. Adam was cordially thanked for his lecture.—*Glasgow Evening News.*

NOTTINGHAM AND DISTRICT TRADES COUNCIL.—A meeting of the Nottingham and District Trades Council was held on the 23rd ult. at the Exchange Hall, the chair being occupied by Mr. J. G. Hancock. With regard to the "contracts resolution" previously adopted by the Council, the Secretary reported that he and Mr. Richards waited, as a deputation, upon the Building Trades Council with a view of ascertaining how far that Council was prepared to support this Council with regard to the contracts resolution which they proposed to put before every candidate for municipal honours. The resolution was an important and far-reaching one, and this Council desired to secure a thoroughly united organisation of labour in the town. When the deputation waited upon the Building Trades Council the latter reminded them that this was a principle for which they (the Building Trades Council) had fought for many years, but they held out very friendly overtures to the deputation. He understood that after the deputation left the matter was referred to a committee, and no doubt this Council would subsequently receive a report. The resolution might require the alteration of a few words to make it stronger, but if they secured a thorough unity of workers he thought they would be arriving at a satisfactory understanding, and he considered that the result of the deputation appeared to be a happy augury for the cohesion of the two Councils.

THE EXECUTION BELLS, ST. SEPULCHRE'S.—It is stated that there was found recently in the church vestry, a relic of old times and old customs. It is the hand-bell which the clerk, or sexton, used to ring outside Newgate Prison on the eve of execution of sentence upon convicts in the "condemned cell." In 1605 Robert Dowe (he is called John Dowe in Munday's Stow) gave 5*l.*, arising out of a rent-charge on premises in West Smithfield, "For ringing the greatest bell in the church on the day the condemned prisoners are executed, and for other services for ever concerning such condemned prisoners." The "other services" included the ringing of the hand-bell, with the repetition of certain admonitory lines at the prison, and whilst the prisoners passed the church on their way to Tyburn. The Duchess Dudley gave a great bell to St. Giles's-in-the-Fields for a like purpose (see Hamper's Dugdale). Dowe's Charity was scheduled a few years ago by the Charity Commissioners, who framed a scheme for diverting the money from its original purpose, and giving it, in trust, to the

rector and churchwardens, to be applied in benefit of deserving and necessitous prisoners upon their discharge, with preference to those committed in the district of the Central Criminal Court. The last execution of sentence at Tyburn took place on November 7, 1783; the first in front of Newgate on December 9, that same year.

IMPROVEMENT OF THE CATHEDRAL APPROACHES, MANCHESTER.—The street improvements round about the Manchester Cathedral are approaching completion, and something like 1,400 square yards of land have been added to the approaches. In Hunt's Bank land to the width of 37 ft. has been added along the west front of the building, and the thoroughfare is now twenty yards wide at the narrowest part. Fennel-street on the one side, and on the other what is known as the Churchyard, the footway from Hunt's Bank, have been considerably improved, and the work of widening Half-street at the east end is being rapidly proceeded with. One result of the extension in Hunt's Bank is that a portion of the shop property between Cateaton-street and the cathedral occupies an unsightly position in front of the building line, and it is intended to set it back to the new boundary wall. Half-street is to be made ten yards wide for vehicular traffic between Hanging Ditch and Fennel-street. On this side will be the new extension of the Corn and Grocery Exchange, which is now being built.—*Manchester City News.*

THE BUILDING REGULATIONS ACT, GLASGOW.—At the last meeting of the Glasgow Building Regulations Act Committee a deputation was received consisting of Messrs. Paterson, Goldie, Ferguson, and Shaw, as representing the Glasgow Building Exchange, Limited, who were heard regarding the amending of certain of the by-laws made under the Building Regulations Act, 1892, as follows:—"(1.) On By-law 31, which provides that 'slates . . . shall be secured by at least two strong copper, or galvanised, or other suitable nails,' that that provision should be limited in its application to every third course of such slates. (2.) On By-law 48, that the provision therein that no wooden mantelpiece 'shall project beyond the face of the jamb more than 1 in. for every 3 in. from the fireplace opening,' should read as from the 'fire-box,' instead of from the 'fire-place opening'; and (3.) On By-law 54, as regards the requirement of all dwelling-house window sashes above the ground floor being hinged or constructed so as to admit of the outsides of the windows being cleaned from the inside of the apartment, that that provision should be made optional, or otherwise that in the meantime, and until a window calculated to meet the requirements of the situation be designed and perfected, and be generally accepted as sufficient to meet such requirements, that provision therein should not be meantime enforced. The Lord Provost assured the deputation that their views would receive the serious consideration of the committee. He was advised by the clerk that the suggestion of making the provision in the last-mentioned by-law (54) optional could not possibly be entertained, in respect that a by-law could not be made optional, as, in its nature, it required to definitely be either affirmative or negative of the subject matter it dealt with.

MANCHESTER SHIP CANAL COMPANY.—The Board of Directors have appointed Mr. W. H. Collier to be manager of both the Ship Canal and Bridgewater Departments of this company. Mr. John C. Willson will continue to occupy the position of assistant manager. The following appointments have also been made:—Mr. John Oldfield to be superintendent, Bridgewater Department, Mr. Herbert M. Gibson, to be chief traffic agent, Ship Canal Department. Mr. Marshall Stevens relinquishes his appointment as manager on the 31st Dec., having entered into an engagement to develop the Trafford Park Estate, which adjoins the Ship Canal from the Manchester Docks to Barton.

MEETINGS.

SATURDAY, JANUARY 2.

Sanitary Inspectors' Association (Carpenters' Hall).—6 p.m.

SUNDAY, JANUARY 3.

Sunday Lecture Society.—Mr. Richard Kerr on "The New Photography: the Röntgen, or X Rays"—with experiments. 4 p.m.

TUESDAY, JANUARY 5.

Royal Victoria Hall, Waterloo-road, S.E.—Professor H. G. Seeley, F.R.S., on "The Heat of the Earth." 8.30 p.m.

WEDNESDAY, JANUARY 6.

Liverpool Engineering Society.—Mr. J. W. Anderson on "Mechanical Refrigeration." 8 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

978.—SELF-CLOSING DOOR HINGES: *E. Edwards.*—This invention relates to a hinge, the rubbing surfaces of which are made of an undulating form round the pin which connects upper and lower parts to the door, which, when opened, always comes back by its own weight to its lowest position. A tubular ring oil-holder is attached.

1,301.—SYPHON CISTERNS: *H. J. Dakin.*—The inventor claims a syphon cistern provided with a cylinder, having mounted upon it a bell, with a small hole therein, actuated by a weighted lever, a long syphon-pipe connected with such cylinder, and to the flushing-pipe, and a shorter syphon-pipe connected to the larger one.

1,408.—MANUFACTURE OF FLOORING BLOCKS, &c.: *G. L. Falconar.*—This invention consists in manufacture of composite blocks, upper stratum being of wood, compressed wood, fibre, &c., and lower of concrete, such surfaces being connected by metal tongues, nails, screws, &c.

1,626.—FLOORS, PLATFORMS, &c., FOR PUBLIC BUILDINGS: *W. Horsfall and Another.*—Consists in making such floors, &c., in two or more parts, pivotted or hinged in the centre, and capable of being raised by jacks or similar mechanism.

1,835.—CHIMNEY COWLS: *K. B. McKenzie.*—In cowls the inventor places a fan or exhauster, arranged to rotate on a horizontal axis by the action of the wind.

2,498.—INSPECTION AND CLEANSING JUNCTIONS FOR DRAINS, &c.: *E. Codling.*—The invention is a junction or eye for drains, &c., provided with internal guides by which the cleansing-rod can be deflected in the direction desired.

2,714.—CHISEL FOR CUTTING STONE, IRON, WOOD, &c.: *J. Dransfield.*—Consists in a steel holder with slit end, forming a pair of jaws capable of being drawn together by set screws or bolts, into which jaws a thin steel blade for cutting can be securely held.

3,128.—HINGES: *W. G. Smith.*—This patent relates to a flush hinge especially designed for falls of pianoforte cases, desk-flaps, &c. The hinge is constructed of two box-like parts connected by a cranked or bent connecting link, hinged at its opposite ends to the inner ends of said box-like portions.

3,237.—STOP BLOCK FOR SINK PIPES, &c.—*F. Hodgess.*—The inventor claims a special combination in a stop block of inlet, trap, outlet, waste water inlet, cleansing inlet, and air inlet.

6,965.—WATERCLOSETS.—*E. A. Green.*—This invention relates to the species of water-closets where a vertical shaft is fixed over a trapped pan, from which shaft water supply issues. The inventor provides a trapped pan, formed with the bottom of pan sloping from top of same into throat of trap, and with top of pan formed at same level as lowest part of the interior of out-go of trap, which fixes the trapped water-line in pan and trap, whereby the pan is kept full of water, with a large surface area for the dejecta to drop into, and the trapped pan is made of smaller depth and capacity.

8,563.—WINDOW FITTINGS: *J. Lumsden.*—This invention consists in the combination of a locking catch, sliding catch, and shoe or socket of special forms.

17,047.—WINDOW SASH-FASTENERS: *W. Reay.*—This fastener consists essentially of a rod passed horizontally through the top and bottom sashes, the rod having one end split and furnished with knobs and notches. Fastener may be also used for other purposes.

23,404.—DOWEL PINS AND JOINTS: *A. J. Boult.*—The inventor adopts a wooden dowel pin, having longitudinal ribs adapted to embed themselves in the wood into which the pin is driven. There are also shallow grooves between ribs adapted to retain glue, and a longitudinal vent groove of greater depth.

NEW APPLICATIONS FOR LETTERS PATENT.

DECEMBER 14.—28,528, J. Waite and Others, Door, Casement, or Window Adjustment.—28,564, S. Bradshaw, Reversible Windows.—28,582, G. Duffield, Water-cl sets.—28,611, L. Cohn, Device for Indicating the Stoppage of Water-closets.—28,615, H. Schröer, Roofing Tiles.

DECEMBER 15.—28,653, T. Horn, Prismatic Lights.—28,664, D. Fletcher, Mechanism for Lifting, Lowering, and Locking Window Sashes, &c.—28,671, C. Stowe, Traps for Waste Pipes, &c.—28,749, J. Minto, Automatic Flushing Cistern.

DECEMBER 16.—28,788, J. Haynes, Sash Line Fastener.—28,795, J. Allen, Apparatus for Obviating the Rattling of Window Sashes and Preventing same from being Opened from the Outside.—28,824, T. Martlew, Chimney and Ventilating Cowls, &c.—28,829, R. Fraser, Roof Supporting Frames.—28,832, G. Brown, jun., Brake for Sash Weights, &c.—28,877, H. Kelshorn and G. Strecker, Kilns.—28,879, M. Mulready, Fire Grates.—28,888, E. Homan, Construction of Walls or Partitions.

DECEMBER 17.—28,929, E. Royston, Tiles, Slabs, &c.—28,962, J. & S. Dibble, Combined Water-closet and Seat.

DECEMBER 18.—29,012, A. Doig, Sea Walls.—29,059, J. Thomas, Treatment of Wooden Surfaces for imitating Mahogany, Rosewood, Enamel, Tortoise Shell, Veneering, &c.—29,111, A. Nicholson, Draught Excluder for Doors and Casements.—29,140, A. Milne, Water Waste Preventer.—29,151, T. C. Fawcett, Limited, and T. Fawcett, Brickmaking Machines.—29,160, A. Wragg, Machine or Die to make Perforated Kiln Bottom Bricks or Lump by means of Power Presses.—29,212, Pitrifite, Limited, Manufacture of Cement.

PROVISIONAL SPECIFICATIONS ACCEPTED.

24,071, J. Chaplin, Sliding Bolts for Doors.—24,711, R. Hunter, Finely Pulverised Substances for Use in the Production of Portland Cement, Pigments, &c.—26,744, J. Duckett & Son, Limited, and Others, Waste Water Closets.—26,745, J. Duckett & Son, Limited, and Others, Sink Fittings.—26,946, E. Bloom and Others, Paint Brushes, &c.—27,116, Tonks, Limited, and J. Whiting, Spring Hinges and Door Springs.—27,279, W. Westecott, Hinges or Pivots for Ventilators, &c.—27,374, H. Hyde and J. Adey, Hinges.—27,406, P. Wood, Kilns.—27,420, M. Newlove, Raising and Lowering Window Sashes.—27,430, J. Longue, Window Fasteners.—27,432, T. Matthews and F. Tarr, Clamps.—27,614, J. Sankey and C. Turnock, Sharpening and Setting Saws.—27,828, J. Morton, Enamelling or Glazing Bricks, Tiles, &c.—27,858, J. Berry, Machines for Moulding Bricks, &c.—28,002, R. Marchant, Gauge for Saws.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to opposition for two months.

24,043, W. Bird and the Globe Inventors' Trading Company, Limited, Windows with Sliding Sashes.—2,015, S. Hellyer, Water-closets, &c.—2,155, J. Shanks, Lavatories.—3,451, W. Ludlow, Mitre Cramp.—3,691, S. Hill and R. Hodges, Mortise Fastenings.—18,743, G. Fuhrer, Socket for Securing Nails, &c., to Walls, &c.—24,902, A. Gries, Slabs for Building and other purposes.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

December 8.—By J. H. NORTH (at Dublin).

Raphoe, co. Donegal.—Enclosures of land, 179 a. 2 r. 3 p., f. £3,000

Clontarf, co. Dublin.—4 and 5, St. John's-ter., u.t. 148 yrs., g.r. 30*l.*, r. 78*l.* £365

1 to 4, 7 and 8, Rosborough-cots., u.t. 148 yrs., g.r. 20*l.*, r. 114*l.* 625

December 11.—By Messrs. MELLERSH (at Godalming.)

Witley, Surrey.—Wheeler-st., "The Star" Inn and 5 cottages adjoining, f., r. 49*l.* 18s. 1,200

Cramhurst-lane—10 building plots, f. 404

Cramhurst-lane—enclosure of land, 1 a. 1 r. 30 p., f. 116

Godalming (near), Surrey.—The Hascombe Post Office, e.r. 20*l.* 425

Lambourne-lane, three freehold cottages, r. 18*l.* 4s. 290

Stoke Newington.—Albion-rd., f.g.r. 26*l.* 6s., reversion in 25 yrs. 1,322

By CLEMENTS & BURTON (at Coventry)

Coventry, Warwick.—56 and 57, Hertford-st., f., r. 39*l.* 820

By Messrs. COBB (at Sittingbourne).

Bobbing, Kent.—The Key Inn and 0 a. 2 r. 18 p., f., r. 40*l.* 2,950

Sheerness-rd., enclosure of land, 3 a. 2 r. 35 p., f., r. 6*l.* 320

Milton-next-Sittingbourne, Kent.—High-st., the White Hart p.h., with house and shop adjoining, and 1 a. 2 r. 27 p., f., r. 54*l.* 2,000

Stockbury, Kent.—"The Harrow" Inn, f., r. 22*l.* 2,000

December 12.—By W. R. NICHOLAS & Co. (at Pangbourne).

Pangbourne, Berks.—Meadowside-rd., nineteen building plots, f. 598

Tidmarsh-rd., three building plots, f. 1,023

December 14.—By ORGILL, MARKS, & ORGILL.

Gravesend, Kent.—Bank-st., "The Gravesend Distillery" and warehouses, also 17, High-st., f. 2,500

By THOMAS PEVER & MILES.

Caterham, Surrey.—"The Railway Hotel" and grounds, f., r. 225*l.* 10,000

By WYATT & SON (at Chichester).

Chichester, Sussex.—38, The Hornet and shop adjoing, f. 700

December 15.—By BEAN, BURNETT, & ELDRIDGE.

Islington.—30 to 36 (even), Charlesworth-st., u.t. 55 yrs., g.r. 38*l.* 10s., r. 218*l.* 1,735

38, Blundell-st., u.t. 55 yrs., g.r. 13*l.* 10s., r. 32*l.* 120

Rotherhithe.—1 to 13, Nolan-place, u.t. 85 yrs., g.r. 40*l.* 500

By CHANCELLOR & SONS.

Barnes.—Gipsy-lane, "Venlaw" and "Fontenay," u.t. 75½ yrs., g.r. 21*l.* 11s. 4d., r. 195*l.* 2,400

By FULLER & FULLER.

Soho.—3, Little Pulteney-st., f., r. 75*l.* 1,360

Notting Hill.—28, Holland Park-av., u.t. 26 yrs., g.r. 9*l.* 10s. 6d., e.r. 110*l.* 1,065

By S. WALKER & RÜNTZ.

Barbican.—35 and 37, Whitecross-st., area 1,770 ft., f. 5,600

City of London.—Fetter-lane, a building site, area 950 ft., f. 2,800

Whitechapel.—Middlesex-st., a corner plot of land, area 580 ft., f. 930

Bishopsgate.—Widegate-st., a building site, area 595 ft., f. 3,025

Whitechapel.—Middlesex-st., &c., six building sites, area 7,442 ft., f. 8,100

By FLEURET, SONS, & ADAMS (at Masons' Hall Tavern).

Poplar.—Emmett-st., "The Union," p.h., a freehold rental of 135*l.*, with reversion in 26 yrs. 3,700

Bayswater.—Westbourne-grove, "The Redan," a profit rental of 100*l.*, for 33½ yrs., with reversion 7,510

By LOUND & HOWITT (at Masons Hall Tavern).

Kentish Town.—Leighton-rd., "The Torriano," P.h., lease for 40 yrs., r. 100*l.* 26,500

By ORGILL, MARKS, & ORGILL (at Masons' Hall Tavern).

Blackheath.—Lee-rd., "Railway Hotel," lease for 53 yrs., r. 120*l.* 21,510

By BOYNTON & PEGRAM (at Waltham Green).

Fulham.—42, 44, 46, and 48, Langford-rd., u.t. 87 yrs., g.r. 24*l.* 590

14 and 15, South-st., u.t. 47 yrs., g.r. 7*l.* 415

By G. B. HILLIARD & SON (at Rayleigh).

Rayleigh, Essex.—Rochford-rd., a freehold house with range of buildings and 2 a. 1 r. 7 p. 650

Rochford-rd., two enclosures, 4 a. 0 r. 31 p., f. ... 430

December 16.—By H. J. BROMLEY.

Norwood.—66, St. Julian's Farm-rd., f. 395

By WAGSTAFF & SONS.

Highgate.—59 and 61, Highgate Hill, u.t. 48½ yrs., g.r. 15*l.* r. 74*l.* 705

By THURGOOD & MARTIN.

Bishopsgate.—21, Camomile-st., and "The Salisbury" Tavern, area 2,200 ft., part f. and part u.t. 52 and 61 yrs., g.r. 39*l.*, r. 416*l.* 9,200

Islington.—Barnsbury-rd., "The Union" Tavern; also 129, Cloudesley-rd., f., r. 85*l.* 1,975

Marylebone.—236, Great Portland-st., r. 80*l.*; also l.g.r. 5s., u.t. 17½ yrs., g.r. 15*l.* 710

55, Bolsover-st., u.t. 7½ yrs., g.r. 18*l.*, r. 80*l.* 370

Islington.—Shepperton-rd., &c., l.g.r. 10*l.*, u.t. 26½, g.r. nil 145

By E. W. RICHARDSON & SON.

New Southgate.—5 and 6, Lower Park-ter., f., r. 55*l.* 10s. 720

Bethnal Green.—75, Quilter-st., u.t. 28½ yrs., g.r. 5*l.* 5s. 220

Poplar.—2, Oriental-st., u.t. 60½ yrs., g.r. 4*l.* 15s., r. 36*l.* 405

By DOUGLAS YOUNG & Co.

Greenwich.—61, Blackheath-rd., u.t. 5 yrs., g.r. 5*l.* 14s., r. 35*l.* 155

Camberwell.—21, Addington-sq., u.t. 8½ yrs., g.r. 6*l.* 14s., r. 40*l.* .....

Battersea.—3, Rollo-st., u.t. 66 yrs., g.r. 1*l.* 17s. 6d., r. 30*l.* 320

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.	ton	£/s/o £/o/o
Teak, E.I.	load	£12/o/o £16/o/o
Sequoia, U.S.ft.cu.		s/o s/1
Ash, Canada load		£2/1o/o £3/15/o
Birch, do.		£3/1o/o £5/5/o
Elm, do.		£3/5/o £4/1o/o
Fir, Dantsic, &c..		£2/1o/o £4/1o/o
Oak, do.		£2/1o/o £3/1o/o
Canada		£4/15/o £5/15/o
Pine, Canada red		o/o/o o/o/o
Do. Yellow		£/o/o £4/o/o
Lath, Dantsic, fath		£4/1o/o £5/1o/o
St. Petersburg		£/o/o £6/1o/o
Wainscot, Riga, &c., log		£2/1o/o £4/15/o
Odessa, crown		£2/1o/o £4/15/o
Deals, Finland 2nd & 1st std	100	£/1o/o £/o/o
Do. 4th & 3rd		£8/1o/o £/o/o
Do. Riga		£7/o/o £8/o/o
St. Petersburg, 1st yellow		£2o/1o/o £23/o/o
Do. 2nd yellow		£9/1o/o £1o/1o/o
Do. white		£/o/o £11/o/o
Swedish		£8/1o/o £16/o/o
White Sea		£1o/o/o £16/1o/o
Canada, Pine 1st		£21/o/o £23/1o/o
Do. do. 2nd		£15/o/o £17/o/o
Do. do. 3rd, &c.		£7/1o/o £11/o/o
Do. Spruce, 1st.		£9/o/o £1o/1o/o
Do. do. 3rd and 2nd		£7/1o/o £8/15/o
New Brunswick		£7/5/o £7/15/o
Battens, all kinds		£5/o/o £6o/o/o
Flooring boards, sq., 1 in. prep. 1st		o/9 6 o/16/6
Do. 2nd		o/8/o o/13/o
Other qualities—		o/6/o o/7/6
Cedar, Cuba, ft.		/4½ /5
Honduras, &c.		/4 /5
Mahogany, Cuba St. Domingo, cargo av.		/4½ 1/8
Mexican, do. do.		/4 /5
Tobasco, do. do.		/5 /7
Honduras, do.		/5 /6½
Box, Turkey, ton		£4/o/o £5/o/o
Rose, Rio		£7/o/o £8/o/o
Bahia		£8/o/o £5/o/o
Satin, St. Doming.		o/o/7 o/1/o

TIMBER *(continued)*.		
Satin, Porto Rico	o/o/7	o/1/6
Walnut, Italian	o/o/8	o/o/7
METALS.		
Iron—Pig, in Scotland	ton 2/8/7	o/o/o
Bar, Welsh, in London	£/15/o	£/17/6
Do. do. at works in Wales	£/1o/o	£/12/6
Do. Staffordshire, in London	£/15/o	£/1o/o
COPPER—British cake and ingot	£2/1o/o	£3/o/o
Best selected	£3/1o/o	£4/o/o
Sheets, strong	£8/1o/o	£9/1o/o
Chili bars	4o/6/3	o/o/o
YELLOW MTL lb.	o/o/5	o/o/5½
LEAD—Pig, Spanish	ton £11/1o/o	£11/12/6
English com. brands	£11/15/o	£11/17/6
Sheet, English 6 lbs. per sq. ft. and upwards	£11/1o/o	o/o/o
Pipe	£13/o/o	o/o/o
ZINC—English sheet	ton £2o/1o/o	o/o/o
Vieille Montagne	£1/1o/o	o/o/o
Spelter	£7/16/3	£7/18/9
TIN—Straits	£8/1/3	o/o/o
Australian	£9/15/o	o/o/o
English Ingots	£2/o/o	£3/o/o
Banca	£o/1o/o	£1/o/o
Billiton	£9/15/o	£o/o/o
OILS.		
Linseed	ton £5/7/6	o/o/o
Cocoanut, Cochin	£8/o/o	o/o/o
Do. Ceylon	£4/o/o	o/o/o
Palm, Lagos	£4/1o/o	o/o/o
Rapeseed, English pale	£7/1o/o	£8/o/o
Do. Brown	£7/o/o	£7/1o/o
Cottonseed ref.	£5/17/6	£6/1o/o
Oleine	£8/1o/o	£9/1o/o
Lubricating U.S.	o/6/3	o/7/6
Do. black	o/4/9	o/6/6
TAR—Stockholm barrel	£2/o	o/o/o
Archangel	o/12/6	o/o/o
Turpentine	ton £2/1o/o	o/o/o

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. N.B.—We cannot publish Tenders unless authenticated by the name and address of the sender: and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under £100, unless in some exceptional cases and for special reasons.]

BARKING (Essex).—For the construction of sewers, &c., Axe-street, New-road, and Bridge-street, for the Urban District Council. Mr. C. J. Dawson, Surveyor, Council Offices, East-street, Barking Town:—

	New-road.	Axe-street.	Bridge-street.	Total.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.
J. Burrill	463 15 0	257 14 0	95 5 0	816 14 0
T. C. Thompson	312 10 7	227 14 4	69 8 4	609 13 3
I. Smith	315 0 0	175 10 0	62 0 0	552 10 0
D. T. Jackson, Barking*	295 0 0	155 0 0	80 0 0	530 0 0

* Accepted.

BERWICK-UPON-TWEED.—For paving Featherbed-lane, for the Sanitary Authority. Mr. Dickinson, Borough Surveyor, Berwick-upon-Tweed:—
Wm. S. Kearton, Castlegate, Berwick-upon-Tweed.. 1s. 10d.
Per superficial yard. For laying only.

BEXHILL.—Accepted for the erection of house and shop in Devonshire-road, Bexhill, for Mr. F. J. Parsen, Hastings. Mr. A. C. D. Hicks, architect, Sea-road, Bexhill:—
C. H. Gold, Bexhill £1,545

BEXHILL.—For the erection of three houses and shops, St. Leonard's-road, Bexhill, for Mr. W. Mayner, Stratford. Mr. A. C. D. Hicks, architect, Sea-road, Bexhill:—

J. Lester	£3,797	H. E. Cruttenden	£3,717
C. W. Pilling	3,749	Peter Jenkins	3,499
Eldridge & Cruttenden	3,737	A. H. White	3,380
Moon & Garner	3,720	C. H. Gold, Bexhill*	2,710

* Accepted.

BEXHILL.—For the construction of sewer, &c., and making Jameson-road, Bexhill, for Mr. W. Mayner, Stratford. Mr. A. C. D. Hicks, surveyor, Bexhill:—

H. E. Cruttenden	£1,445 o	E. Gutsell	£1,307 o
W. Hudson	1,438 o	J. W. Webb	1,133 o
W. Piper	1,375 o	S. Carey, Bexhill*	1,091 10

* Accepted.

BEXHILL.—For the erection of house and shop, corner of Wilton and St. Leonard's-roads, Bexhill, for Mr. W. Mayner, Stratford. Mr. A. C. D. Hicks, architect, Bexhill:—

Padgham & Hutchinson	£1,212 10	A. H. White	£1,179 11
H. E. Cruttenden	1,188 o	Charles Thomas	1,031 o
		T. W. Dexter, Bexhill*	967 o

* Accepted.

BRIDLINGTON.—For the construction of sea defences, Sands-lane and Carr-lane, for the Urban District Council. Mr. R. Railston Brown, Surveyor to Bridlington Urban District Council, Prospect-street, Bridlington Quay. Quantities by Mr. J. Watson, 62, Whitefriargate, Hull:—

J. Hudson	£6,144 o o	A. Brunton & Son	£3,980 7 7
W. Barnes	5,699 o o	J. Sanguin	3,919 10 o
Whitaker Bros.	5,415 1 5	B. Robinson, 20, West Parade, Hull*	3,859 10 o
A. Braithwaite & Co.	5,047 o o		

* Accepted.

CELBRIDGE (Ireland).—For the erection of two labourers cottages, Coldblow, for the Union Guardians. Mr. L. A. McDonnell, architect:—
Patrick Moore, Dunboyne £990

CROYDON.—For the erection of detached house, Park-lane, Croydon, for Mr. Bruce Johnstone. Mr. A. Broad, architect, 3, High-street, Croydon. Quantities by the architect:—

E. J. Burnand	£1,722	E. P. Bulled & Co.	£1,594
W. Smith & Son	1,688	W. Marriage & Co.	1,528
S. Hart	1,681	E. J. Saunders	1,498
S. Page	1,664	J. Smith & Sons	1,468
D. W. Barker	1,635	A. Bullock*	1,394
G. E. Bryan & Son	1,620		

* Accepted.

DENBIGH.—For additions, &c., at the North Wales Counties Asylum. Messrs. C. O. Ellison & Son, architects, 22, Sir Thomas-street, Liverpool. Quantities by the architects:—

J. Henshaw & Sons	£62,319	H. Willcock & Co.	£53,435
S. Webster	57,890	S. Warburton, Miles Platting, Manchester*	50,382
Jones & Sons†	57,000		
J. Parnell & Son	56,859		

* Accepted.
† Exclusive of addenda.
[Architects' estimate, exclusive of addenda, £49,800.]

DOVER.—For providing, laying, &c., cast-iron water-mains &c., Folkestone-road, for the Town Council:—

Harry Hill	£909 o o	J. Pickthall & Son, Camberwell*	£603 11 4
Smart & Turner	788 o o		
L. H. Green	730 o o		

* Accepted.

DOVER.—For the supply of 1,400 tons broken granite, &c., for the Town Council:—

	Granite per ton.	Siftings per ton.
	s. d.	s. d.
R. L. & J. Fennings	11 9	8 3
E. & H. Beevers	11 6	8 6
W. Griffiths	11 0	7 9
L. Sommerfeld	11 2	7 1
John Mowlem & Co.	10 11	7 6
A. & Y. Mannelle, Leadenhall-street*	10 8	7 5
Paramor & Son	Informal.	

* Accepted.

DRIFFIELD.—For additions to National Schools, Driffield. Mr. J. Shepherdson, architect, Driffield:—

M. Gage	£251 18	T. Rudd	£246 10
C. W. Dry	249 o	W. Leason & Son*	242 o

All of Driffield.]
* Accepted.

EASINGTON (Durham).—For the supply and erection of iron hospital for infectious diseases, with outbuildings, for the Rural District Council:—
W. Harbrow, South Bermondsey Station, S.E. £631 17

FILEY (Yorks.).—For alterations, &c., to Crompton House, for Mr. F. Smith. Mr. Jos. Shepherdson, architect, 14, Middle-street South, Driffield:—

Sawden Bros.	£432 o	O. Rymer, Filey*	£381 o
W. Barnes	398 10		

* Accepted.

FRIMLEY.—For the erection of six cottages. Mr. A. E. Hall, architect, Frimley, Surrey:—

Kemp	£1,870	Finch*	£1,810
Seward	1,820		

*Accepted.

GOLCAR.—Accepted for the erection of a residence, Scarhouse, for Mrs. Fielding. Mr. Arthur Shaw, architect, Golcar:—

Masonry.—Hirst, Firth, & Co., Golcar	£350
Joinery.—James Garside, Golcar	140
Plastering, &c.—Dan Shaw, Golcar	63
Slating.—T. Allison, Milnsbridge	42
Plumbing, &c.—T. Allison	65

GREAT YARMOUTH.—For additions to "The Anchor and Hope Hotel," Gorleston Pier, for Messrs. E. Lacon & Co. Messrs. Bottle & Olley, architects, Great Yarmouth:—

R. Eastoe	£1,928 o	A. E. Bond	£1,752 o
C. Wiseman	1,860 o	G. W. Beech	1,711 10
W. Cork	1,840 o	Carter & Wright	1,700 o
C. C. J. Caffley	1,813 o	T. Howes, Great Yarmouth*	1,683 o
A. J. Davy	1,798 o		
F. Grimble	1,770 o		

* Accepted.

Plumbers.

H. J. Harvey	£217 o	G. Platt & Son	£140 15
J. Atherton	180 o	G. W. Gorda	135 o
J. E. Dyson	168 o	H. E. Forder, Great Yarmouth*	122 o
G. Read	149 o		
J. T. Goffin	145 15		

* Accepted.

HASLINGDEN.—For the erection of boiler house, chimney, &c., for the Outfall Sewerage Board. Mr. H. Leonard Hinnell, C.E., 41, Corporation-street, Manchester:—
Collinge, Haslingden, as per schedule of prices.

KEIGHLEY.—For the execution of private improvement works, Dove and Wren streets, for the Corporation. Mr. W. H. Hopkinson, C.E., Municipal-buildings, Keighley:—

Dove-street.

W. Baker, Gladstone-street, Keighley ..... £156 8 o

Wren-street.

W. Baker, Gladstone-street, Keighley 27 14 6

LEEDS.—Accepted for the erection of two labourers' cottages, Scarcroft, Leeds, for Mr. H. Miers. Mr. W. Carby Hall, architect, Prudential-buildings, Park-row, Leeds. Quantities by the architect:—

Bricklaying and Masonry.—G. Nettleton & Sons, Roundhay	£214 o
Carpentry and Joinery.—A. & B. Harrison, Thorner	135 10
Plumbing and Glazing.—Wesley Briggs, Leeds	19 o
Plastering.—T. Moore, Leeds	57 o
Tiling.—Watson & Worsnop, Leeds	42 o

LONDON.—For the erection of additional premises at Gladstone-road, Battersea, for the Globe Foundry Company:—
W. Harbrow, South Bermondsey Station, S.E. £846

LONDON.—For the erection of iron church for the Rev. Percy M. Bayne, at Manor Park, E.:—
W. Harbrow, South Bermondsey Station, S.E. £327 5

LONDON.—For erecting the Kennington-road public baths and washhouses, for the Commissioners of Baths and Wash-houses for Lambeth. Mr. A. Hessell Tiltman, architect, 6, John-street, Bedford-row, London, W.C.:—

General Engineering Work.

Summerscales & Sons	£8,240	J. & F. May	£6,480
Berry & Sons	7,996		

Three Lancashire Boilers.

J. Fraser & Sons	£1,984	Anderton & Sons	£1,850
Yates & Thom	1,950	Taylor & Sons*	1,725
Leeds and Bradford Boiler Co.	1,880		

* Accepted.

LONDON.—For engineering work for the new women's swimming-bath, Caledonian-road Baths, and additions to the public washhouse, for the Vestry of St. Mary, Islington. Mr. A. Hessell Tiltman, architect, 6, John-street, Bedford-row, London, W.C.:—

Cudlipp & Co.	£4,567 7 9	W. J. Fraser & Co.	£3,300 o o
New & Mayle	4,425 o o	Bradford & Co.	3,159 o o
Potter & Sons	4,245 o o	Clarke & Sons	3,152 o o
Summerscales	4,130 o o	Purcell & Nobbs	2,943 o o
Russell & Co.	3,847 o o	Sugg	2,914 o o
Fraser & Fraser	3,429 o o	Moorwood & Sons*	2,571 14 o
May Bros.	3,400 o o		

* Accepted.

LONDON.—Accepted for alterations and repairs at 129, Hoxton-street, Hoxton, for Mr. G. Gottwein:—
W. Scowen ..... £179.

LONDON.—For alterations and additions, 29, Gordon-road, Peckham, for Dr. Hague. Mr. J. William Stevens, architect, 21, New Bridge-street, City, E.C.:—

G. Parker	£457 o	A. J. Browne	£397 15
J. Bowyer & Co.	437 o	W. H. Castle	345 o
A. White & Co.	435 o	H. King (accepted)	330 o

For Ovens.

Smith & Sons (accepted) £178 10

LONDON.—For alterations and additions to Langwathby, Belsize-lane, Hampstead, for Mr. A. R. Bax. Mr. J. William Stevens, architect, 21, New Bridge-street, City, E.C.:—

E. Wheeler	£1,274 o	A. J. Brown	£1,120 o
W. Hudson	1,190 o	Pease & Kentish	1,090 o
W. Pearce	1,121 10	W. Thompson*	1,117 o

* Accepted.

LONDON.—For four houses, Duke-road, Chiswick, for Mr. Wm. Portch. Mr. Herbert S. White, architect, 159, High-road, Chiswick:—

Morris & Co.	£1,276	Nichols	£1,200
Plumridge	1,270	Hume	975
Hampton & Sons	1,231	Leeder & Co. (accepted)	937
Thomas	1,230		

LONDON.—Accepted for the erection of a new warehouse at Turnham Green, for the Army and Navy Auxiliary Co-operative Supply, Limited. Mr. J. Darch, architect. Quantities by Messrs. John Leaning & Sons:—
E. E. Nightingale £8,230

LONDON.—For the execution of sewerage works, Burnt Oak, Orange Hill (Low Level Sewerage, Contract No. 4) for the Urban District Council of Hendon. Mr. S. Slater Grimley, Engineer, Public Offices, the Burroughs, Hendon, N.W.:—

	A. London Stoneware Pipes with Doulton's Self-adjusting Joints.	B. London Stoneware Pipes with Tarred Gaskin and P.C. Joints.	C. For Approved Country Pipes with Stamford Joints.	D. For Approved Country Pipes with Tarred Gaskin and P.C. Joints.
	£. s. d	£. s. d.	£. s. d.	£. s. d.
Newton, P.	4015 10 2	4108 16 5	3903 7 5	3617 15 4
Pattinson, F.	4519 0 0	3995 0 0	3959 0 0	3909 0 0
Adams, T.	4142 14 2	3940 14 8	3736 1 8	3670 10 8
Dickson, J.	4253 11 1	3835 7 11	3774 6 0	3462 10 10
Hollingsworth, E.	4148 0 0	3719 0 0	3543 0 0	3461 0 0
Ballard, R. B.	4117 9 9	3799 19 0	3542 17 9	3396 15 3
Betterill, W. J., Aylsham, Norfolk	3826 0 0	3482 0 0	3149* 0 0	2991 0

* Accepted.

NEATH (Wales).—For the erection of the Cambrian Hotel, for Mr. E. E. Bevan. Messrs. Lambert & Rees, architects, Metropolitan Bank Chambers, Neath. Quantities by architects:—

		If Forest of Dean stone instead of Bath. Extra.
D. Evans, Sons, & Co.	£3,253	£180
W. T. Morgan	3,088	10
David Rees	2,742	90
W. J. Bloxham	2,598	207
Evan Thomas	2,502	107
W. Lissamann	2,549	—
Walters & Johns	2,450	—
W. Williams	2,380	63
Gustavus Bros.	2,347	110
Thomas Watkins & Co.	2,299	82
Thomas Walters	2,264	—
Bennett Bros.	2,250	85
David Jenkins	2,238	38
Abraham George, Neath (accepted)	2,208	99
Thomas Davies	1,950	52

PONTYPRIDD.—For the erection of two villa-residences at Graigwen for Messrs. W. & D. Thomas. Messrs. Griffiths & Jones, architects, Pontypridd & Tonypandy:—

J. Snelling	£2,843	J. C. Richards, Pontypridd*	£2,139
D. C. Jones & Co.	2,684	A. J. Colborne	2,096
W. Lissaman, Jun.	2,490		
M. Julian	2,345		

* Recommended for acceptance.

RISCA (Mon.).—For the erection of school buildings, Cross Keys, for the School Board. Mr. Geo. Rosser, architect, Victoria-chambers, Abercarn, Mon. Quantities by Mr. R. L. Roberts, Holly House, Newbridge, Mon.:—

Lawson & Co.	£3,761 o	A. S. Morgan & Co.	£3,435 o
C. Loch	3,650 o	Davies Bros.	3,405 8
T. Westicott	3,499 o	Jno. Pritchard, Pontymister*	3,400 o
J. Moules & Co.	3,485 o	E. Mainwaring	3,395 o
J. Lenlims	3,463 o	J. Charles	3,803 o
C. H. Reed	3,459 o		

* Accepted.

ST. LEONARD'S-ON-SEA.—For alterations to Nos. 24 and 26, London-road, for Mr. George Mence Smith. Mr. W. B. Cooper, architect, 21, Havelock-road, Hastings:—

W. Crouch	£498	A. H. White	£382
S. P. Miller & Son	401	Eldridge & Cruttenden, St. Leonards (accepted)	378
Padgham & Co.	395		
H. E. Cruttenden	385		

ST. LEONARD'S-ON-SEA.—For alterations and additions to stabling, and cottage at "Tilleworth" Silverhill, St. Leonard's, for Mr. W. Knighton, LL.D. Mr. Wm. Cooper, architect, 21, Havelock-road, Hastings:—

A. H. White	£700 o	Padgham & Co.	£495 o
G. Vigor & Co.	512 o	H. Ashdown, St. Leonard's	482 o
Sims & Olney	498 10		

* Amended and accepted at £515

WATFORD.—For the erection of additional premises for the Acme Tone Engraving Company:—
W. Harbrow, South Bermondsey Station, S.E. £262 12

WATFORD.—For erecting a new brewery, for Messrs. Benskin's Watford Brewery, Limited:—

J. Allen & Sons	£9,665 o	J. Chessum	£7,667 o
General Builders, Ltd.	9,600 10	S. Grist	7,588 o
F. Dupont	8,540 o	Charles Brightman	7,543 o
W. J. Chinchen	7,930 o	Webster & Cannon	7,415 o
G. & J. Waterman	7,860 o	Charles Eames	7,344 o
George Wiggs	7,800 o	Henry Martin, Northampton*	7,150 o
Thomas Turner Ltd.	7,795 o		
J. Willmott & Sons	7,742 o		

* Accepted.

WORSBOROUGH-DALE (Yorkshire).—For the construction of sewers and streets, for Mr. Benjamin Turner. Messrs. Wade & Turner, surveyors, 10, Pitt-street, Barnsley:—

J. Higham & Sons	£1,635 o o	Wm. Johnson	£1,407 18 o
H. Burrows & Sons	1,580 19 o	Geo. Porter & Sons, Worsbordale*	1,289 7 5
George Mellor	1,546 15 o		
James Taylor	1,476 10 o		

* Accepted.

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENT.

COMPETITION.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
Designs for Houses	J. C. Hill, 7, Archway-rd. Upper Holloway, N.	20l.; 10l.; and 5l.	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
Paving Works, Hope-street, &c.	Ramsbottom U.D.C.	J. W. Barlow, Clerk, 17, Market-pl. Ramsbottom	Jan. 5
Making-up Gainsborough-road, &c.	Felixstowe U.D.C.	F. B. Jennings, Town Hall, Felixstowe	Jan. 6
Sewage Purification Works, Swanston-street	Glasgow Corp.	J. Lindsay, City-chambers, Glasgow	do.
Twelve Houses, Pellon Station, Halifax		M. Hall, Archt 29, Northgate, Halifax	do.
*Sewer Pipes	Belfast Corp.	J. C. Bretland, Town Hall	do.
Schools and House, Goldthorpe-lane Ends, Yorks	Bolton-on-Dearne Sch. Board	H. L. Tacon, Archt. Westgate, Rotherham	do.
*Making-up and Paving Roads	Southend Corp.	H. Harlock, Clarence-rd. Southend	Jan. 7
*Enlarging Urinals and Conveniences	do.	do.	do.
*Wood Paving	do.	do.	do.
Additions to School, West-parade, Halifax		Jackson & Fox, Archt. 22, George-street, Halifax	Jan. 8
Chapel	Thornbury (Glos.) Burial Board	S Fudge, Archt. Thornbury	Jan. 9
Outfall Sewer, Craigie	Perth Police Commrs.	R. M'Killop, 12, Tay-st. Perth	do.
Library, Belgrave-road	Leicester Corp.	A. H. Hind, Archt. 3, Grey Friars, Leicester	Jan. 11
Chapel and School, Manchester-road, Bury, Lancs.		T. Nuttall, Archt. 20, Market-st. Bury	do.
*Fencing	Carshalton U.D.C.	W. W. Gale, Council Offices	do.
Warehouse, Liverpool	M. S. & L. Ry. Co.	O. S. Holt, Secy. London-rd. Station, Manchester	Jan. 12
*Making-up and Paving Roads	West Ham Council	L. Angell, Town Hall, Stratford, S.E.	do.
Pipe Sewers, Queen's-road	Hertford Corp.	J. H. Jevons, Surv. Town Hall	do.
New Road	Budleigh Salterton (Devon) U.D.C.	E. G. Warren, Archt. Commercial-chambers, Exeter	do.
Flint, Road Metal, &c. Horsham	West Sussex C.C.	W. B. Purser, County Surv. 31, Bedford-rd. Horsham	Jan. 13
*Erecting Boiler House	West Ham Union	F. J. Sturdy, Guardians' Offices, Leytonstone, E.	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c. Supplied by	Tenders to be delivered.
*Making-up and Paving Roads	Fulham Vestry	C. Botterill, Town Hall, Walham Green, S.W.	do.
Banking Premises, Cockermouth	Carlisle, &c. Banking Co.	G. D. Oliver, Archt. Carlisle	do.
Chapel and School, Bradley, near Keighley		J. Hartley, Archt. Skipton	do.
Five Cottages, Hubert-road, Wimbledon		W. Cooper, Archt. 21, Havelock-road, Hastings	Jan. 14
*Cherbourg Granite	Gravesend T.C	Boro' Surv.	do.
Waterworks, Christchurch, Hants	West Hampshire Water Co.	R. St. G. Moore, C.E. 17, Victoria-street S.W.	do.
Drainage Works	Bolton Corp.	Hinnell & Murphy, C.E. 41, Corporation-street, Manchester	Jan. 16
Restoration of Church, Broadhampton, Devon		E. Sedding, Archt. 12, Athenæum-st. Plymouth	do.
Additions to St. Paul's Church, Alnwick		Forster & Paynter, Fenkle-street, Alnwick	do.
*Schools	Burnham-on-Crouch Sch. Bd.	F. Chancellor, Chelmsford	Jan. 18
School, Bedlinog, S. Wales	Gelligaer Sch. Bd.	James & Morgan, Archt. Charles-st. Chmbrs. Cardiff	do.
Pavilion at Hospital, Flaybrick Hill	Birkenhead Corp.	C. Brownridge, C.E. Town Hall	do.
*Works and Materials	Wandsworth B. of W.	Offices, East Hill, Wandsworth	Jan. 19
*Works and Stores	Chiswick U.D.C.	A. Ramsden, Vestry Hall, Chiswick	Jan. 20
*Officers' House and Outbuildings, Dengemarsh, Kent	Admiralty Commrs.	Works Department, 21, Craven-street, W.C.	Jan. 22
Sewers, &c.	Porthcawl U.D.C.	F. Beesley & Son, Engr. 11, Victoria-street, S.W.	Jan. 23
*Buildings, Sheds, Stores, and Quay Wall	Poplar B. of W.	The Surveyor, 117, High-street	Jan. 25
Additional Vagrant Wards	Hartley Wintney Union	The Clerk, Union House, Winchfield	Jan. 29
*Construction Arabic Museum and Library, Cairo	Egyptian Government	Ministry of Public Works, Cairo	Feb. 1
Cement Paving, Iron, & Brick Curbing	Presteigne U.D.C.	E. Ince, Council Offices, Presteigne	do.

PUBLIC APPOINTMENT.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Two Inspectors of Sewage Works	Carshalton U.D.C.	2l. 10s. per week	Jan. 19

Those marked with an asterisk (*) are advertised in this Number. *Competition, p. iv. Contracts, pp. iv., vi., viii. & x. Public Appointment, pp. xxvii.*

LONDON SCHOOL BOARD TENDERS.

The following lists of tenders were submitted by the Works Committee at a recent meeting of the London School Board:—

"ASHBURNHAM."—Heating:—

W. G. Cannon & Sons	£437 0 0	J. Wontner Smith, Gray & Co.	£275 18 0
G. Davis	300 0 0	J. C. & J. S. Ellis, Ltd.*	269 10 0
W. Simmons	297 15 8		

BALTIC-STREET.—Cleaning:—

C. Chase & Son	£559 17 0	W. Hornett	£138 0 0
W. Irwin	272 0 0	Marchant & Hirst	128 10 0
G. S. S. Williams & Son	215 0 0	W. Chappell	124 15 0
Johnson & Co.	168 0 0	Morrison & Goodwin	122 0 0
A. M. Sparks	154 10 0	J. Kybett*	117 0 0

BEETHOVEN-STREET.—Cleaning:—

G. H. Sealey	£210 15 0	W. Hornett	£ 64 0 0
S. Callow	197 11 0	E. Flood	148 0 0
F. T. Chinchen	196 19 0	E. T. Folley*	127 0 0
H. C. Clifton	185 0 0	W. Brown	124 0 0
G. Neal	178 17 0		

BERGER-ROAD.—Altering stepped flooring, &c.:—

W. Silk & Sons	£64 0 0	W. Martin*	£47 10 0
G. Wales	59 7 8		

BOLINGBROKE-ROAD.—Cleaning:—

R. E. Williams & Sons	£255 10	W. Hammond	£160 0
H. Brown	165 0	E. P. Bulled & Co.	149 0
H. Mallett	164 0	C. Gurling*	125 0
Rice & Son	162 0		

"BRECKNOCK."—Staircase, &c.:—

	If "Victoria Stone" be used.	If "Hobman's Stone" be used.
C. Dearing & Son	£137 0	£134 0
T. Cruwys	136 15	134 0
Stevens Bros.	133 8	130 18
J. Grover & Son	132 0	132 0
McCormick & Sons	124 12	121 0
G. S. S. Williams & Son	115 0	112 0
F. Britton†	110 0	110 0

BRIXTON-HILL.—Heating:—

B. Harlow & Son	£620 0	J. Fraser & Son	£468 0
Comyn Ching & Co.	579 18	Duffield & Co.	456 0
J. Grundy	510 0	J. C. Christie†	411 10
W. Richardson & Co.	480 0		

BROCKLEY-ROAD.—Heating:—

G. Davis	£320 0	J. W. Brooke	£175 0
Tabor & Hinchcliffe	274 9	J. Biggs	164 10
Bates & Pearce	176 0	J. C. & J. S. Ellis, Lim.†	147 10

BUCK'S-ROW.—Repairing stoves:—

J. Wontner-Smith, Gray & Co.	£22 3	J. Defries & Sons, Ltd.	£18 0
Comyn Ching & Co.	19 18	E. Coules & Son	15 0
J. F. Clarke & Sons	19 10	W. G. Cannon & Sons*	12 0

CAMPBELL-STREET.—Repairing stoves:—

J. Wontner-Smith, Gray, & Co.	£53 5	J. Defries & Sons, Ltd.	£36 0
Comyn Ching & Co.	43 10	E. Coules & Son	34 0
J. F. Clarke & Sons	42 0	W. G. Cannon & Sons*	24 0

CHEQUERALLEY (New Portion).—Cleaning:—

R. E. Clarke	£388 15	W. Hornett	£125 0
W. Irwin	210 0	G. H. Rowe	£125 0
W. Lawrence	157 7	W. Martin	117 10
Johnson & Co.	137 10	W. Chappell*	98 10

CONWAY-ROAD.—Heating:—

G. Davis	£689 0	J. & F. May	£595 0
Comyn, Ching, & Co.	679 10	Vaughan & Brown, Ltd.	593 0
H. C. Price Lea & Co.	629 0	W. Richardson & Co.	572 0
J. C. & J. S. Ellis, Ltd.	599 0	J. Grundy*	546 0

DEMPSEY-STREET.—Heating:—

Tabor & Hinchcliffe	£464 0	Maguire & Son	£347 15
Teale & Somers	394 0	Russell & Co.	319 0
A. J. Kallaway & Co.	389 0	C. Seward & Co.†	308 0

DULWICH HAMLET.—Cleaning:—

W. Smith	£133 0	H. Mallett	£72 10
G. Kemp	90 0	Maxwell Bros., Ltd.	65 0
Holliday & Greenwood	79 0	J. & C. Bowyer	55 0
Mid Kent Building and Contracting Works, Ltd	72 0	H. Somerford & Son*	43 0

EAST-LANE.—Heating:—

Wippell Bros. & Row	£225	G. Davis	£136
W. G. Cannon & Sons	148	J. Grundy*	105

EDWARD-STREET (temporary).—Cleaning:—

S. Musgrove	£139 18 0	W. Banks	£108 13 6
Jones & Groves	121 14 0	E. Proctor*	90 0 0

ELEANOR-ROAD.—Heating:—

I. C. & J. S. Ellis, Ltd.	£559	J. F. Clarke & Sons	£453
Vaughan & Brown, Ltd.	538	J. Defries & Son, Ltd.	409
J. & F. May	520	A Dougill & Co, Ltd.	405

ELTRINGHAM-STREET.—Erecting manual training centre:—

W. V. Goad	£1,008 0	Lathey Bros.	£602 0
E Lawrance & Sons	1,087 0	I. Garrett & Son	986 0
W. Downs	1,080 0	J. F. Ford	944 0
Holloway Bros.	1,061 0	W. Akers & Co.	929 0
G. G. Wade	1,041 0	E. Triggs*	890 10
W. Hammond	1,022 0		

FARNCOMBE-STREET.—Cleaning:—

H. J. Williams	£310 0	W. Hornett	£240 0
Marchant & Hirst	264 17	H. Line	216 0
Stevens Bros.	249 10	Johnson & Co.*	203 0

"FORSTER."—Cleaning:—

W. H. Stephens	£292 10	McCormick & Sons	£237 0
G. S. S. Williams & Son	256 0	Stevens Bros.*	213 10
J. Grover & Son	252 0		

GARRATT-LANE.—Heating:—

J. Fraser & Son	£95 0	Rosser & Russell, Ltd.*	£53 10
H. C. Price Lea & Co.	65 0		

GIDEON-ROAD.—Providing a new pattern kindergarten gallery, &c.:—

I. Garrett & Son	£70 0	Lathey Bros.	£54 10
W. Hammond	63 0	F. B. Tucker	52 15
T. Cruwys	59 0	Wake & Dean†	50 0
E. Triggs	58 10		

GLOUCESTER-GROVE EAST.—Cleaning:—

R. E. Williams & Sons	£282 0	G. James & Son	£136 13
W. Hornett	176 0	E. Flood	120 0
Lathey Bros.	173 0	W. Brown*	95 10
T. Cruwys	167 0		

HAMOND-SQUARE.—Cleaning:—

G. Chase & Son	£857 10	J. Kiddle & Son	£193 0
W. Shurmur	241 0	W. Silk & Son	190 0
W. Lawrence	239 4	Morrison & Goodwin	156 5
W. Martin	210 0	J. Kybett*	129 0

HARGRAVE PARK.—Heating:—

B. Harlow & Son	£742 0 0	Fraser & Fraser, Limited	£657 0 0
W. G. Cannon & Sons	698 18 6	H. C. Price Lea & Co.	654 0 0
J. C. & J. S. Ellis, Limited	675 0 0	G. Davis	590 0 0
J. Wontner-Smith, Gray, & Co.	665 0 0	J. W. Brooke*	474 0 0

HARWOOD-ROAD.—Erecting new offices, &c.:—

G. Neal	£1,717	R. E. Nightingale	£1,628
W. Hammond	1,715	E. Triggs	1,583
Lathey Bros.	1,681	R. A. Yerbury & Sons*	1,489
J. Garrett & Son	1,679		

HASELTINE-ROAD (Old and new portions).—Cleaning:—

A. Black & Son	£421 0	W. Akers & Co.	£266 0
E. Proctor	320 0	H. Leney	199 0
Mid-Kent Building and Contracting Works, Limited	267 0	J. & C. Bowyer*	191 10

HOLLAND-STREET.—Cleaning:—

Lilly & Lilly, Limited	£149 0	G. Wales	£121 0
G. Kemp	130 0	I. Kiddle & Son	109 0
H. J. Williams	120 0	Stimoson & Co.	96 10
W. & H. Castle	126 5	E. Triggs*	83 0
R. Harding & Son	126 0		

HORSEFERRY-ROAD.—Cleaning:—

F. G. Minter	£189 0	G. Brittain	£148 0
Rice & Son	172 0	I. F. Ford	138 15
W. Hornett	159 0	G. Foxley	133 0
Lilly & Lilly, Limited	150 0	C. Gurling*	105 7
T. Cruwys	149 0		

KEETON'S-ROAD.—Heating:—

Tabor & Hinchcliffe	£109 0	Duffield & Co.	£163 0
C. P. Kinnell & Co.	185 0	I. C. & J. S. Ellis Ltd.	137 10
Hill & Drummond	179 10	J. Wontner Smith, Gray, & Co.†	131 10
J. & F. May	165 0		

LAXON-STREET.—Heating:—

I. Grundy	£67 0	W. Simmons*	£27 6
Vaughan & Brown, Ltd.	29 7		

LYHAM-ROAD.—Cleaning:—

Maxwell Bros., Ltd.	£178	E. P. Bulled & Co.	£157
I. Garrett & Son	169	Star & Son	145
Rice & Son	160	E. Triggs	119
Holloway Bros.	158	H. Somerford & Son*	92

MANCHESTER-STREET.—Cleaning:—

Marchant & Hirst	£198 0	A. M. Sparks	£176 0
T. Nicholson	196 0	S. H. Cornfield	142 0
G. Wales	179 12	G. Foxley	130 0
T. Cruwys	177 0	W. Chappell*	129 15

TOWER HAMLETS (Millwall).—Heating:—

F. Milan	£840	A. J. Kallaway & Co.	£407
E. Oldroyd & Co., Ltd.	675	W. Richardson & Co.	469
W. G. Cameron & Sons	597	Wippell Bros. & Row	525
I. Grundy	528	J. Fraser & Son*	418
Vaughan & Brown	511		

MINA-ROAD.—New Lavatories for teachers, &c.:—

Akers & Co.	£275	W. V. Goad	£220
W. Hammond	258	B. E. Nightingale	213
I. Marsland	245	Rice & Son	189
G. Parker	245	R. A. Marshall	186
Lathey Bros.	240	J. Frampton*	165

MORDEN-TERRACE.—Cleaning:—

W. V. Goad	£254 0 0	H. Leney	£217 0 0
Mid-Kent Building and Contracting Works, Ltd.	240 0 0	W. Banks	102 12 6
		Jones & Groves*	188 15 9

Mounting drawings and tracings:—

	Mounting tracings on linen and paper at per sq. ft.	Mounting drawings on linen only at per sq. ft.
E. Fox & Co.	6d.	4d.
E. J. Wilkes	5d.	3d.
Lawrence & Aitken	3d.	1½d.
The Whitehall Press, Ltd.	3d.	1½d.
E. Daw & Son	2d.	1½d.
C. Bell	2d.	1½d.
A. E. Mallandain	2d.	1½d.
W. Bishop*	1½d.	1½d.

NAPIER-STREET.—Laundry Centre and Manual Training Centres:—

J. Willmott & Sons	£5,914	£166
Staines & Son	5,611	95
W. Shurmur	5,272	158
Killby & Gayford	5,235	160
Dove Bros.	5,195	160
J. Grover & Son	5,140	170
R. A. Yerbury & Sons	4,989	130
C. Miskin	4,951	159
E. Lawrance & Sons	4,861	159
W. Smith*	4,868	143

OLDFIELD-ROAD.—Cleaning:—

W. Shurmur	£198 0	G. Barker	£135 0
C. Willmott	195 0	A. W. Derby	134 0
J. Grover & Son	175 15	J. Kiddle & Son	131 0
T. Nicholson	164 0	S. H. Corfield*	118 0
W. H. Stephens	156 5	W. Silk & Son	96 0

OLD WOOLWICH-ROAD.—Cleaning:—

W. Holding & Son	£186 0	Jones & Groves	£159 0
E. Proctor	170 0	W. Banks*	134 10

PHILPOT-STREET.—Providing and fixing a fence. The following are the amounts of the tenders received:—

D. Gibb & Co.	£24 0	W. Gates	£16 16
S. Tuddenham	22 0		

PLUMSTEAD-ROAD.—Heating:—

W. G. Cannon & Sons	£150 0	J. F. Clarke & Sons	£111 0
J. & F. May	132 0	J. C. & J. S. Ellis, Ltd.	102 10
J. Grundy	123 0	Vaughan & Brown, Ltd.	91 15

PLUMSTEAD-ROAD.—Manual Training Centre:—

W. Downs	£1,905 0	£32	0
J. Smith & Sons	1,084 0	40	0
H. Somerford & Son	1,064 0	35	0
B. E. Nightingale	1,049 0	98	0
E. Lawrance & Sons	1,046 0	32	0
E. Proctor	1,022 13	99	6
T. F. Ford	1,012 0	23	10
Holliday & Greenwood	990 0	25	0
T. Otway	982 0	18	0
E. P. Bulled & Co.	981 0	25	0
W. Akers & Co.	934 0	23	0
J. & M. Patrick*	935 0	20	0

PORTOBELLO-ROAD.—Cleaning:—

S. Callow	£224 14	F. T. Chinchen	£159 17
H. C. Clifton	210 0	W. R. & A. Hide	129 10
G. Neal	198 10	E. T. Folley	124 0
J. Christie	173 10	W. Brown*	118 0

PURRETT-ROAD.—Cleaning:—

E. Proctor	£240 0 0	W. Banks*	£159 17 6

RILEY-STREET.—Cleaning:—

J. Garrett & Son	£312 0	W. Banks	£225 0
Lilly & Lilly, Ltd.	258 0	H. Line	222 0
H. J. Williams	231 0	Johnson & Co.*	214 10

ROLLS-ROAD.—Heating:—

Tabor & Hinchcliffe	£698 10	Wippell Bros. & Row	£400 0
Turner & Co.	635 0	J. F. Clarke & Sons*	383 0
W. Truswell & Son	445 0		

ST. ANDREW'S-STREET.—Cleaning and exterior painting to be done at Easter:—

Holloway Bros.	£398 0	Stimpson & Co.	£270 10
W. Smith	386 0	E. B. Tucker	249 0
Lathey Bros.	327 0	H. Somerford & Son	244 0
J. Garrett & Son	284 0	E. Triggs*	238 0

SANDFORD-ROW.—Heating:—

G. Davis	£150 0 0	J. Grundy	£88 10 0
W. G. Cannon & Sons	104 19 6	Duffield & Co.	88 0 0
J. Wontner-Smith, Gray, & Co.	96 0 0	Vaughan & Brown, Ltd*	81 15 0

"SHAFTESBURY" TRAINING SHIP.—Heating:—

J. Wontner-Smith, Gray, & Co.	£438 17	J. F. Clarke & Sons	£234 0
J. & F. May	390 0	Wenham & Waters, Ltd.	208 0
W. G. Cannon & Sons	250 0	J. C. & J. S. Ellis, Ltd	195 0
Vaughan & Brown, Ltd.	247 0	Duffield & Co.	194 0
		J. Biggs*	176 8

SHILLINGTON-STREET.—Cleaning and exterior painting to be done at Easter:—

H. Brown	£508 0	J. Garrett & Son	£332 0
C. Gurling	366 10	B. E. Nightingale	325 0
Holliday & Greenwood	365 0	A. W. Derby	315 0
K. E. Williams & Sons	355 0	E. B. Tucker*	277 0

SMALLWOOD-ROAD.—Heating:—

Teale & Somers	£774	J. Wontner-Smith, Gray, & Co.	£576
Turner & Co.	643	Russell & Co.	489
E. Oldroyd & Co., Ltd.	610	W. Truswell & Son†	470

STANHOPE-STREET.—Providing and fixing a glazed partition, &c.:—

G. Chase & Son	£195 10	McCormick & Sons	£82 0
Cowley & Drake	105 0	Marchant & Hirst	78 15
F. T. Chinchen	89 9	A. M. Sparks*	72 10
T. Cruwys	84 0		

PLUM-LANE.—Supply of burnt ballast or Dartford gravel at the Plum-lane School:—

	Burnt ballast at per load.	Dartford gravel at per load.
	s. d.	s. d.
H. Bentham	14 9	14 9
E. Proctor	11 0	14 0
J. Harper	5 0	

SWAFFIELD-ROAD.—Heating:—

Maguire & Son	£748 16	Wippell Bros. & Row	£485 10
Stode & Co.	667 0	J. C. Christie	472 10
J. C. & J. S. Ellis (Ltd.)	659 0	A. Dougill & Co. (Ltd.)†	445 0
W. G. Cannon & Sons	633 0		

TEESDALE-STREET.—Providing and fixing a Kindergarten gallery, &c.:—

Illingworth, Ingham & Co.	£82 0	D. Gibb & Co.	£57 0
E. Spencer & Co.	79 10	W. Martin	53 0
J. Kiddle & Son	72 0	T. Cruwys*	49 0
K. E. Clarke	69 0		

UPTON HOUSE.—Providing a floor and drain:—

Johnson & Co.	£87 15	J. Christie	£58 0
T. Cruwys	67 0	J. T. Robey	54 0
F. G. Minter	60 0	Stevens Bros.*	41 0

REPAIRS TO SCHOOL BUILDINGS ON A SCHEDULE OF PRICES:—

Names of Contractors.	CITY.	CHELSEA.				FINSBURY.						WEST-MINSTER.	Board's Head Offices.
		1	2	3	4	1	2	3	4	5	6		
W. T. Ballard	....	....	....	....	....	....	....	....	....	....	+15	....	....
F. Britton	....	....	....	....	....	....	....	....	+25	+25	+25	....	....
W. Brown	....	+15	+15	....	....	....	....	....	....	....	....	....	....
S. Callow	....	+25	....	....	....	....	....	....	....	....	....	....	....
M. Calnan & Co.	+15	....	....	....	....	....	....	....	....	....	....	....	....
D. Charteris	....	....	....	....	....	....	....	....	....	....	....	+20	+20
G. Chase & Son	....	....	....	....	....	+75	+75	....	....	....	....	....	....
H. C. Clifton	....	+15	....	....	....	....	....	....	....	....	....	....	....
T. Cruwys	....	....	....	....	....	....	....	....	....	....	....	+10*	....
Dove Bros.	+22½	....	....	....	....	....	+22½	+22½	+22½	+22½	....	....	....
E. T. Folley	....	+20	....	....	....	....	....	....	....	....	....	....	....
Graham & Graham	....	....	....	....	....	+10*	+12½*	....	....	....	....	....	....
T. L. Green	....	....	....	....	....	+17½	+17½	....	....	....	....	....	....
J. Grover & Son	....	....	....	....	....	....	+15	....	+15*	....	....	....	....
C. Gurling	....	....	....	....	+15	....	....	....	....	....	....	....	....
W. Hammond	....	....	....	+10*	+10*	....	....	....	....	....	....	....	+25
F. W. Harris	....	....	....	....	....	....	+15	+15	+15	....	....	....	....
W. R. & A. Hide	....	+15	+12½*	+15	+17½	....	....	....	....	....	....	....	....
W. Hornett	....	....	....	....	....	+15	+15	....	....	....	....	....	....
Johnson & Co.	+9*	....	....	....	....	+9	+9	+12½	....	....	....	+10	+20
Lathey Bros.	....	....	+15	+10	+10	....	....	....	....	....	....	+10	+17½*
Lilly & Lilly, Ltd.	....	....	....	....	....	....	....	....	....	....	....	+20	+20
J. Marsland	....	....	....	....	....	....	....	....	....	....	....	+12½	....
W. Martin	....	....	....	....	....	....	+25	....	....	....	....	....	....
McCormick & Sons	....	....	....	....	....	+25	+25	+20	+20	+20	+25	....	....
F. G. Minter	....	....	....	+25	....	....	....	....	....	....	....	+22	42½
C. Miskin	....	....	....	....	....	+20	+20	+20	+20	+20	+20	....	....
Morrison & Goodwin	....	....	....	....	....	....	....	....	+16½	....	....	....	....
J. Mowlem & Co.	....	+25	+25	+25	+25	....	....	....	....	....	....	+25	+25
G. Neal	....	+17½	+17½	....	....	....	....	....	....	....	....	....	....
T. Nicholson	....	....	....	....	....	+15	+15	+17½	....	....	....	+15	....
B. E. Nightingale	....	....	....	....	....	+30	....	....	....	....	....	+30	+25
G. H. Sealey	....	+25	....	....	....	....	....	....	....	....	....	....	....
A. M. Sparks	....	....	....	....	....	+10	....	....	....	....	....	....	....
W. H. Stephens	....	....	....	....	....	....	....	....	....	....	+10*	....	....
Stevens Bros.	+20	....	....	....	....	+15	+15	+15*	+15	+15*	+15	....	....
E. B. Tucker	+12½	+9	+9	+9	+9	+12½	+12½	+12½	+12½	+12½	+12½	+10	+15
J. J. White	....	....	....	+20	....	....	....	....	....	....	....	....	....
G. S. S. Williams & Sons	....	....	....	....	....	....	....	+25	....	....	....	....	....
R. A. Yerbury & Sons	....	+10*	+12	+12	+12	....	....	....	....	....	....	....	....

Names of Contractors.	GREENWICH.						HACKNEY.					
	1	2	3	4	5	6	1	2	3	4	5	6
A. Acworth	....	....	....	+17	....	....	....	....	....	....	....	....
W. Banks	....	....	At sch.*	....	....	....	....	....	....	....	....	....
F. Britton	....	....	....	....	....	....	+32½	+32½	+32½	+32½	+32½	+32½
J. & C. Bowyer	....	....	....	+20	....	....	....	....	....	....	....	....
M. Calnan & Co.	....	....	....	....	....	....	....	....	....	....	....	+20
Couchman & Co.	....	....	....	....	....	+20	....	....	....	....	....	....
C. Foreman	+7½*	+7½*	+12½	+12½*	....	....	....	....	....	....	....	....
J. Grover & Son	....	....	....	....	....	....	....	....	+15*	....	....	....
Johnson & Co.	....	....	....	....	+11½	....	....	....	+11½	+11½*	+11½*	+11½*
Jones & Groves	....	....	....	....	+12½	+12½*	....	....	....	....	....	....
G. Kemp	....	....	....	+15	....	....	....	....	....	....	....	....
J. Kiddle & Son	....	....	....	....	....	....	....	....	+33½	....	+33½	....
W. Lawrence	....	....	....	....	....	....	+22½	....	+22½	+22½	....	....
W. Martin	....	....	....	....	....	....	....	....	+25	+25	....	....
McCormick & Sons	....	....	....	....	....	....	+25	+25	+20	+25	....	....
Morrison & Goodwin	....	....	....	....	....	....	+16½	....	+16½	....	....	....
S. Musgrove	....	....	....	....	+5*	....	....	....	....	....	....	....
J. & A. Oldman	....	....	....	....	+15	+15	....	....	....	....	....	....
J. Otway	+22½	+22½	+22½	+22½	+22½	+22½	....	....	....	....	....	....
J. & M. Patrick	....	....	....	....	+22½	....	....	....	....	....	....	....
Rice & Son	....	....	....	....	+13	....	....	....	....	....	....	....
W. Shurmur	....	....	....	....	....	....	+17½	+17½*	....	....	....	....
Stevens Bros.	....	....	....	....	....	....	+15*	+17½	+17½	+17½	+17½	....

Names of Contractors.	TOWER HAMLETS.							EAST LAMBETH.				
	1	2	3	4	5	6	7	1	2	3	4	5
G. Barker	....	....	....	....	+20	+20	+20	....	....	....	....	....
J. & C. Bowyer	....	....	....	....	....	....	....	+20	....	....	....	....
M. Calnan & Co.	....	....	....	....	+17½	+15	+15	....	....	....	....	....
W. & H. Castle	....	....	....	....	....	....	....	+17½	+17½	+17½	+17½	+17½
D. Charteris	....	....	....	....	....	....	....	....	+20	+20	+20	+20
S. H. Corfield	....	....	....	+25	....	....	....	....	....	....	....	....
A. W. Derby	....	....	....	+18	+18	+18	+18	....	....	....	....	....
W. Downs	....	....	....	....	....	....	....	....	....	+15	+15	+15
J. F. Ford	....	....	....	....	....	....	....	....	....	....	+15	+15
D. Gibb & Co.	+17½	+17½*	+17½*	+15	+15	+17½	+17½	....	....	....	....	....
Johnson & Co.	....	....	....	....	....	+11½	+11½	....	+10	+10	+9	+9
J. Kybett	....	....	....	....	+25	....	....	....	....	....	....	....
Lathey Bros.	....	....	....	....	....	....	....	....	....	....	+10	+10
H. Line	....	....	....	....	....	....	....	+9*	+9*	+9*	....	....
J. Marsland	....	....	....	....	....	....	....	....	....	+10	+9*	+9
Maxwell Bros., Limited	....	....	....	....	....	....	....	....	....	....	....	+12½
G. Munday & Sons	....	+15	+15	+15	+10*	+10*	+10*	....	....	....	....	....
B. E. Nightingale	....	....	....	....	....	....	....	....	+30	+30	+30	+30
J. & A. Oldman	....	....	....	....	....	....	....	+15	+15	....	....	....
Rice & Son	....	....	....	....	....	....	....	+10	+10	+12	....	+10
Star & Son	....	....	....	....	....	....	....	....	....	....	+19	+14
A. E. Symes	....	+10*	....	....	....	....	....	....	....	....	....	....
E. B. Tucker	....	....	....	....	....	....	....	+9	+9	+9	+9	+9

Names of Contractors.	WEST LAMBETH.						MARYLEBONE.			SOUTHWARK.			
	1	2	3	4	5	6	1	2	3	1	2	3	4
W. T. Ballard	....	....	....	....	....	....	+15	....	....	....	....	....	....
G. Brittain	at sch.*	....	....	....	....	....	....	....	....	....	....	....	at sch.*
H. Brown	....	....	....	+15	+15	....	....	....	....	....	....	....	....
J. & C. Bowyer	....	....	....	....	....	+20	....	....	....	....	....	....	....
E. P. Bulled & Co.	+17½	+17½	+17½	+17½	+17½	+17½	....	....	....	....	....	....	....
S. Callow	....	....	....	....	....	....	+25	+20	....	....	....	....	....
W. Chappell	....	....	....	....	....	....	....	+33½	....	....	....	....	....
W. & H. Castle	....	....	....	....	....	....	....	....	....	+17½	+17½	+17½	+17½
D. Charteris	+20	....	....	....	....	....	....	....	....	....	....	....	+20
H. C. Clifton	....	....	....	....	....	....	....	+15	....	....	....	....	....
W. Downs	+15	+15	....	....	....	....	....	....	....	+15	+15	+15	+15
J. F. Ford	+12½	....	....	....	....	....	....	....	....	....	....	....	....
J. Garrett & Son	+10	+10	+10	+10	+10*	+15	....	....	....	....	....	....	....
Graham & Graham	....	....	....	....	....	....	....	....	+10	....	....	....	....
C. Gurling	....	....	+15	+15	....	....	....	....	....	....	....	....	....
W. Hammond	+12½	+15	+12½	+10	+10	....	....	....	....	....	....	....	....
R. Harding & Son	+10	+8½	....	....	....	....	....	....	....	....	....	....	....
Johnson & Co.	+9	....	....	....	....	....	....	....	....	+9*	+9*	+9	+9
G. Kemp	....	....	....	....	....	+12½	....	....	....	....	....	....	....
Lathey Bros.	+8½	+8½	+7½*	+12½	+12½	+20	....	....	....	+15	+15	+10	+10
H. Line	....	....	....	....	....	....	....	....	....	+9	+9	+9*	+9
Marchant & Hirst	....	....	....	....	....	....	+30	+20	+20	....	....	....	....
J. Marsland	+9	+10	....	....	....	....	....	....	....	....	....	+12½	+10
Maxwell Bros., Ltd	+12½	+12½	+12½	+12½	....	....	....	....	....	....	....	....	....
F. G. Minter	....	....	....	....	....	....	....	....	+25	....	....	....	....
B. E. Nightingale	+30	+30	+30	..	....	....	....	....	....	+30	+30	+30	+30
J. & M. Patrick	+25	....	....	+25	....	....	....	....	....	+20	....	....	....
Rice & Son	+10	+10	+10	+10	....	....	....	....	....	+15	....	....	+10
W. Smith	+7½	+7½	....	....	....	....	....	....	....	....	....	....	....
H. Somerford & Son	+10	+5*	+10	....	....	....	....	....	....	....	....	....	....
A. M. Sparks	....	....	....	....	....	....	....	....	+10*	....	....	....	....
Star & Son	+14	+10	+15	....	....	....	....	....	....	....	....	....	....
Stevens Bros.	....	....	....	....	....	....	+15	+15	+15	....	....	....	....
E. B. Tucker	+9	+7½	+7½	+7½*	×7½	+10*	....	....	....	+10	+10	+10	+10
H. J. Williams	....	....	....	....	....	....	....	....	....	+30	....	+30	....
R. E. Williams & Sons	....	....	+15	+15	+15	....	....	....	....	....	....	....	....
R. A. Yerbury & Sons	....	....	....	....	....	....	+10*	+10*	+12	....	....	....	....

TAR-PAVING ON A RUNNING CONTRACT.

Schedule.	W. H. Benstead & Son.	Brunswick Rock Asphalte Paving Co.	W. E. Constable & Co., Limited.	W. Gibbs & Co.	A. C. W. Hobman & Co.*	D. Marchin & Co.†	Josiah Smart.
per sq. yd.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
New tar-pavement	2 2	2 10	1 11½	2 11	1 11	2 2	2 0
Repairs	2 4	4 0	2 0	3 6	1 11	4 0	2 0
Re-arranging old surfaces to new falls (labour only)	0 6	1 0	0 2	1 0	0 2	0 6	0 2
Running	0 1½	0 4	0 1½	0 8	0 1½	0 2	0 2½
Topping	0 9½	1 6	0 10½	0 9	0 10½	1 2	0 11

WARPLE-WAY.—Heating:—

F. Milan	£850	G. Davis	£550
W. G. Cannon & Sons	837	A. Y. Dougill & Co., Ltd.	481
Turner & Co.	675	J. W. Brooke†	449
J. F. Clarke & Sons	569		

WEBB-STREET.—Re-building offices, &c.:—

W. Downs	£1,720	J. Marsland	£1,580
E. E. Nightingale	1,675	Stimpson & Co.	1,580
Lathey Bros.	1,590	J. Garrett & Son*	1,573
J. & C. Bowyer	1,580		

WILLIAM-STREET.—Cleaning:—

G. H. Sealey	£540 5 6	W. R. & A. Hide	£395 0 0
J. J. White	340 15 0	F. G. Minter	287 0 0
F. T. Chinchen	320 0 0	B. E. Nightingale	255 0 0
Marchant & Hirst	314 5 0	W. Brown	245 0 0
W. Hammond	311 10 0	J. Christie*	213 0 0

WOLVERLEY-STREET.—Refitting and reconstructing offices and providing new drainage scheme:—

W. V. Goad	£1,988	E. Lawrance & Son	£1,735
F. G. Minter	1,878	E. Triggs	1,516
W. Shurmur	1,870	G. S. S. Williams & Son	1,513
J. Grover & Son	1,820	W. Akers & Co.*	1,597
G. Parker	1,760		

WALNUT TREE-WALK:—

Maxwell Bros., Ltd.	£255 0	J. F. Ford	£158 0
Rice & Son	210 0	H. J. Williams	149 0
R. Harding & Son	167 0	B. E. Nightingale	144 0
G. Brittain	166 0	J. & M. Patrick*	126 0
Star & Son	160 12		

SLEAFORD-STREET:—

H. Brown	£225	G. Foxley	£155
R. E. Williams & Sons	221	J. & M. Patrick*	115
Holloway Bros.	185	C. Gurling	105
Lathey Bros.	169	E. B. Tucker	104
E. P. Bulled & Co.	165		

CREEK-ROAD:—

E. Proctor	£130 0 0	S. Musgrove	£118 5 0
Jones & Groves	121 3 0	Holliday & Greenwood*	106 0 0
W. Holding & Son	119 0 0	W. Banks	104 15 6

* Accepted.
† Recommended for acceptance.

TO CORRESPONDENTS.

W. H. H. (Below our limit).—J. D. (Amount should have been stated).

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

PUBLISHER'S NOTICES.

***Registered Telegraphic Address*, 'THE BUILDER,' LONDON.**

CHARGES FOR ADVERTISEMENTS.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS, TRADE AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under ..... 4s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

Terms for series of Trade advertisements, also for Special Advertisements on front page, Competitions, Contracts, Sales by Auction, &c., may be obtained on application to the Publisher.

SITUATIONS WANTED.

FOUR lines (about thirty words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

PREPAYMENT IS ABSOLUTELY NECESSARY.

***** Stamps *must not* be sent, but all small sums should be remitted by Cash in Registered Letter or by Postal Orders, payable to DOUGLAS FOURDRINIER, and addressed to the Publisher of "THE BUILDER," No. 46, Catherine-street, W.C.**

Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the Front Page should be in by TWELVE noon on WEDNESDAY.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before 10 a.m. on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder," may have *Replies addressed to the Office*, 46, Catherine-street, Covent Garden, W.C. *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES, { NINEPENCE EACH. By Post (carefully packed) 1s.

W. H. Lascelles & Co.,

121, BUNHILL ROW, LONDON, E.C.

Telephone No. 270.

HIGH-CLASS JOINERY,
LASCELLES' CONCRETE

Architects' Designs are carried out with the greatest care.

CONSERVATORIES,
GREENHOUSES,
WOODEN BUILDINGS,
Bank, Office, & Shop Fittings.
CHURCH BENCHES & PULPITS.

ESTIMATES GIVEN ON APPLICATION.

SUBSCRIBERS in LONDON and the SUBURBS, (by prepaying at the Publishing Office, 19s. per annum or 4s. 9d. per quarter), can ensure receiving "The Builder," by *Friday Morning's Post*.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom, at the rate of 19s. per annum PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 26s. per annum. Remittances (payable to DOUGLAS FOURDRINIER) should be addressed to the publisher of "THE BUILDER," No. 46, Catherine-street, W.C.

THE BATH STONE FIRMS, Ltd.
BATH,
FOR ALL THE PROVED KINDS OF
BATH STONE.
FLUATE, for Hardening, Waterproofing, and Preserving Building Materials.

HAM HILL STONE.
DOULTING STONE.
The Ham Hill and Doulting Stone Co.
(incorporating The Ham Hill Stone Co. and C. Trask & Sons, The Doulting Stone Co.).
Chief Office:—Norton, Stoke-under-Ham, Somerset.
London Agent:—Mr. E. A. Williams, 16, Craven-street, Strand,

A TEST OF OVER FORTY YEARS
has proved that
SZERELMEY STONE LIQUID
Absolutely waterproofs and preserves Bricks, Stone, Cement, Stucco, Plaster, &c.
SZERELMEY & Co., Rotherhithe New-road, S.E.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [ADVT.

SPRAGUE & CO.'S
INK-PHOTO PROCESS,
4 & 5, East Harding-street, Fetter-Lane, E.C. [Advt.

QUANTITIES, &c., LITHOGRAPHED accurately and with despatch.
METCHIM & SON, 20, Parliament-st. S.W.
"QUANTITY SURVEYORS' TABLES,"
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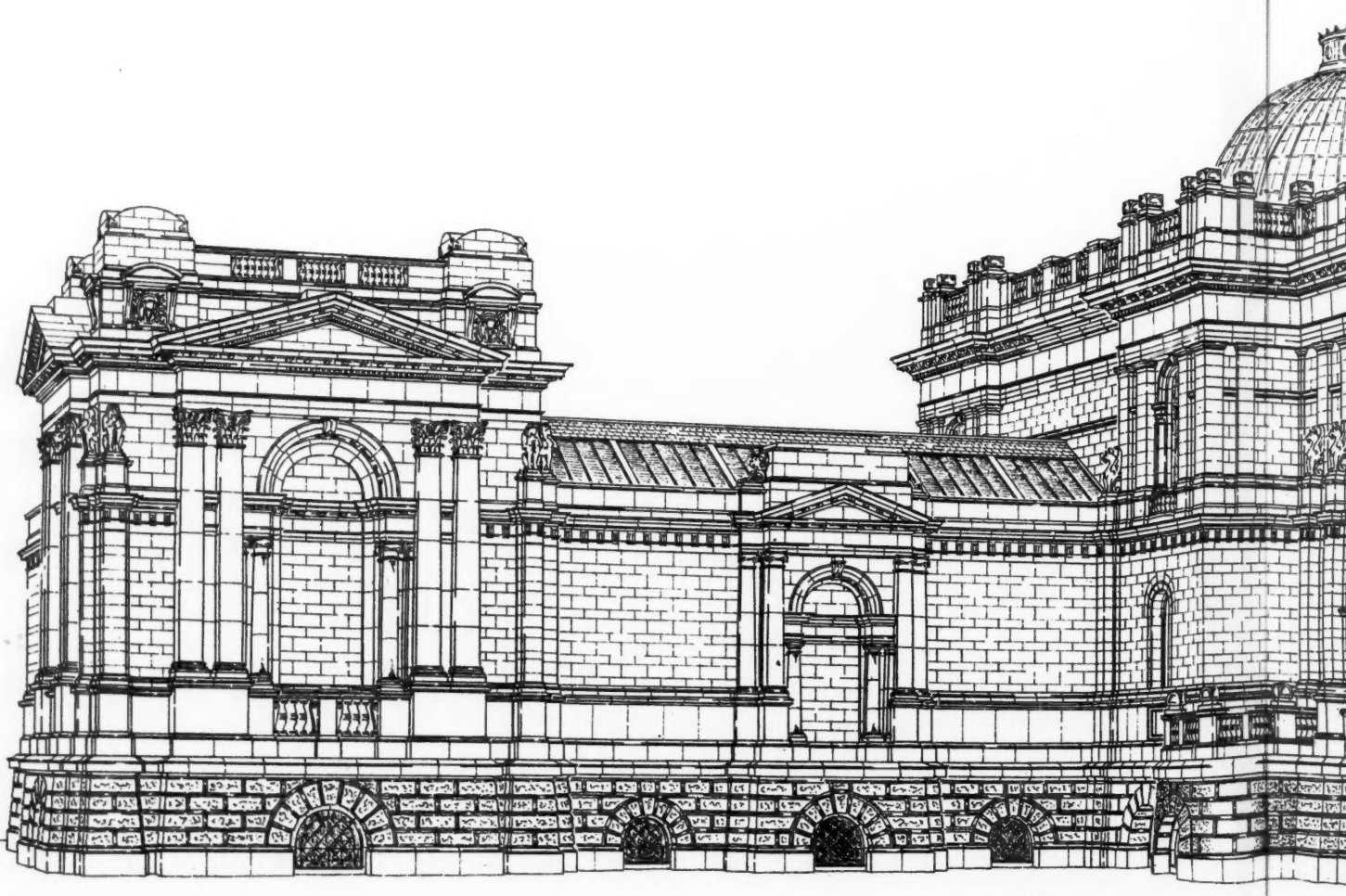

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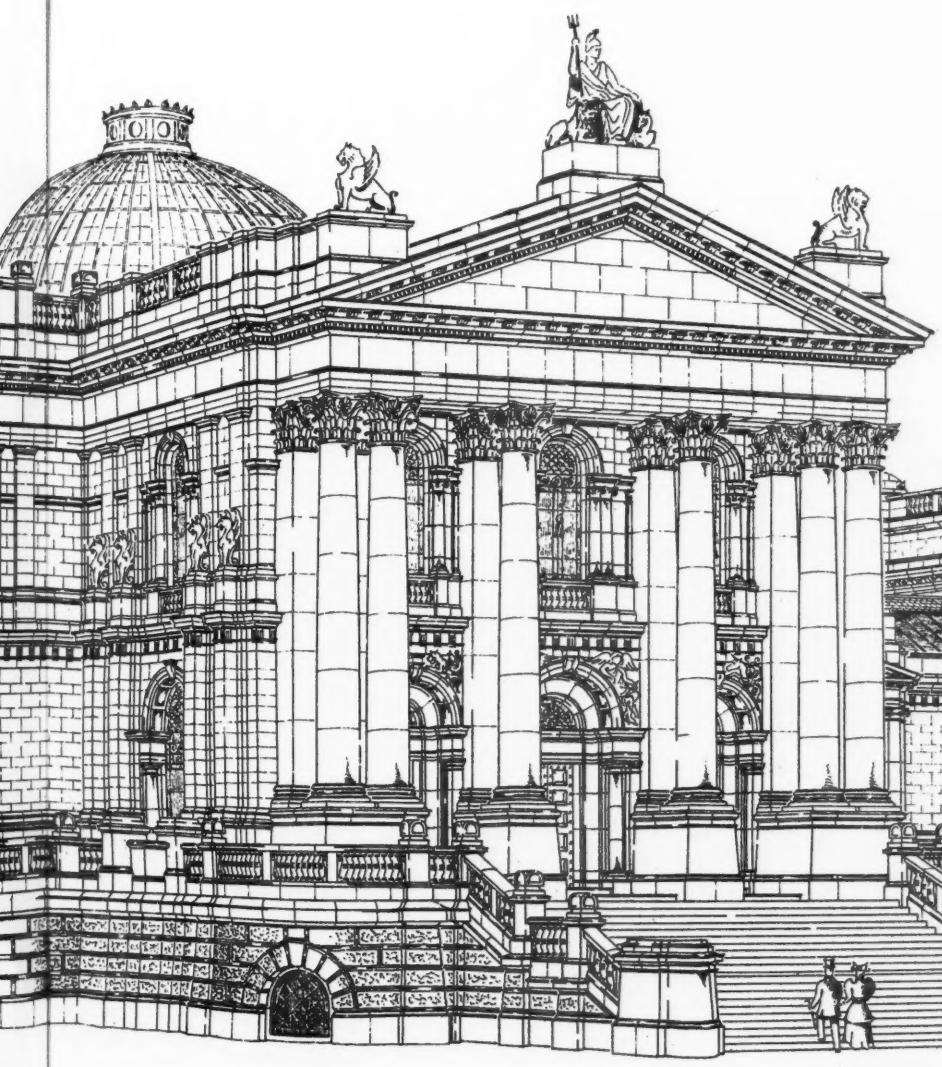

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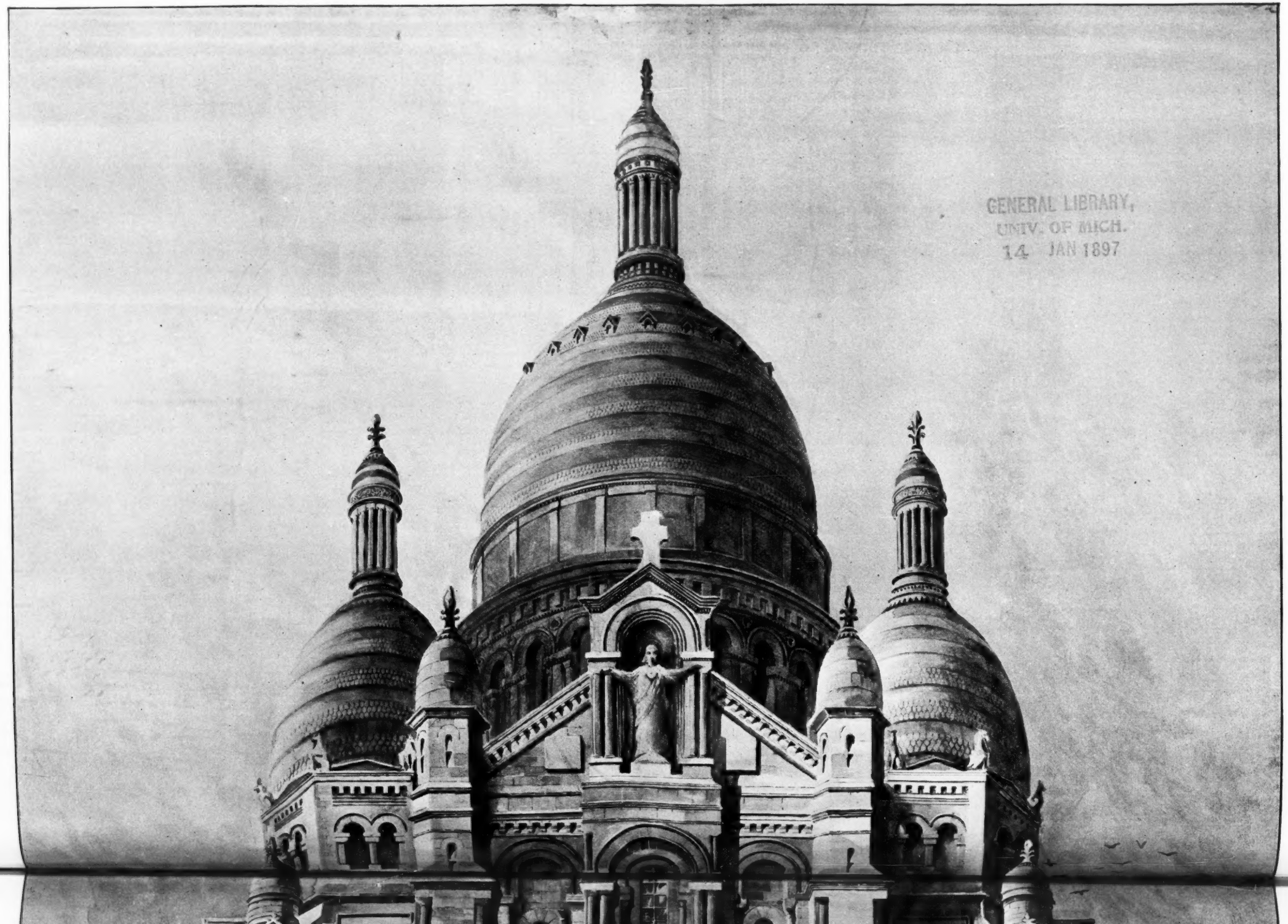

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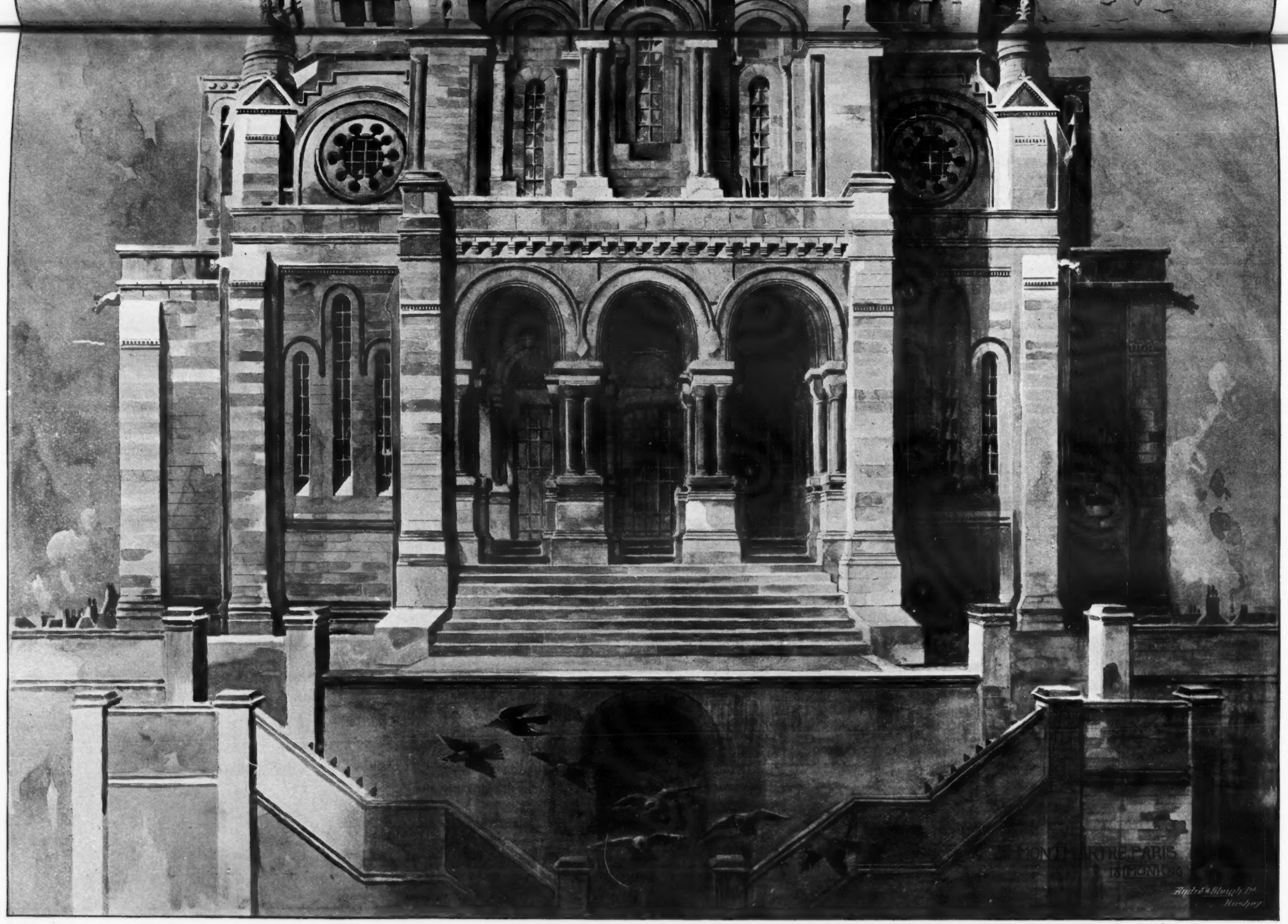

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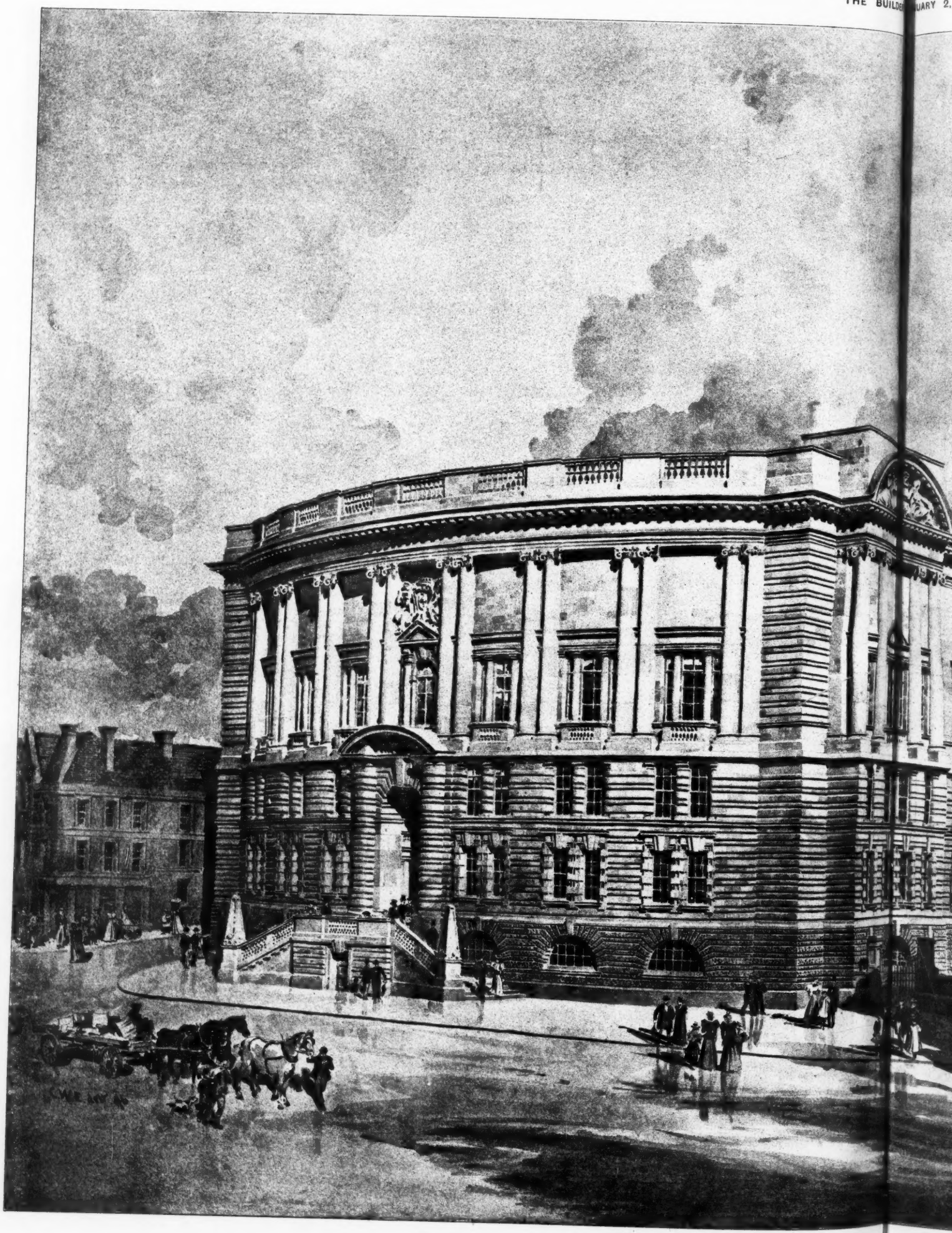

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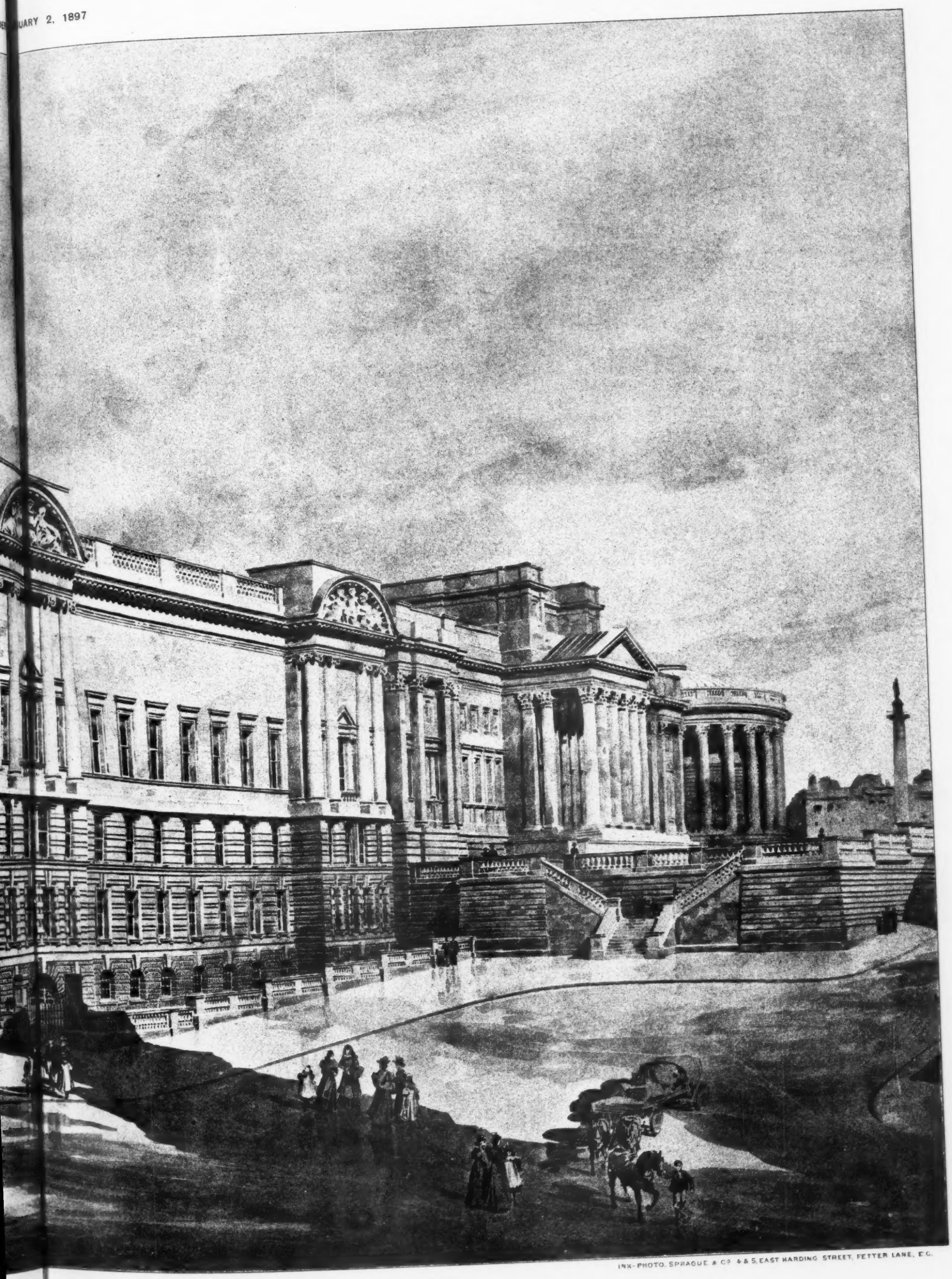

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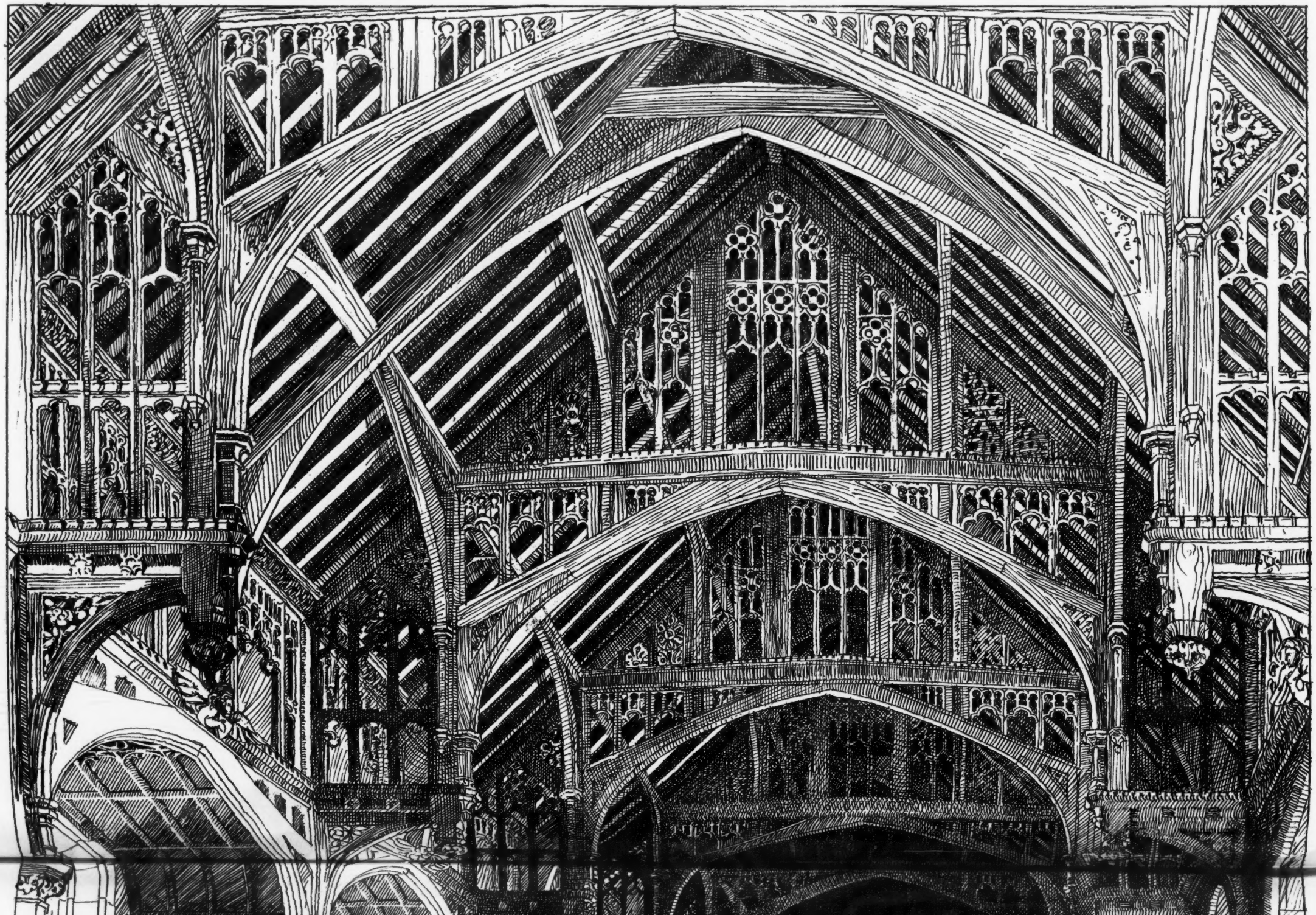

THE CHURCH HOUSE WESTMINSTER

THE INTERIOR OF THE GREAT HALL

SIR ARTHUR BLOMFIELD R.A.
ARCHITECT

W. CURTIS GREEN
DEL.
1898.

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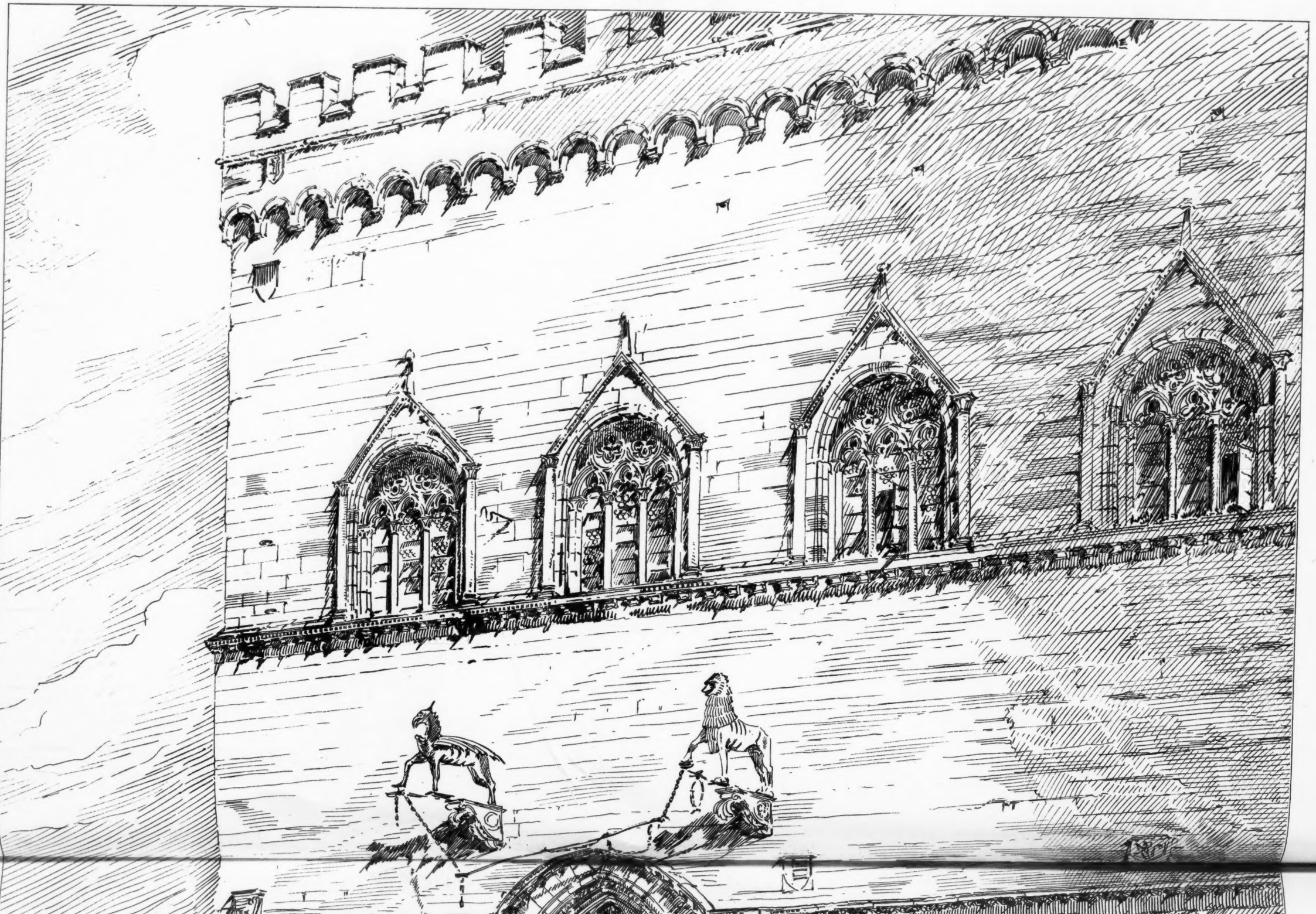

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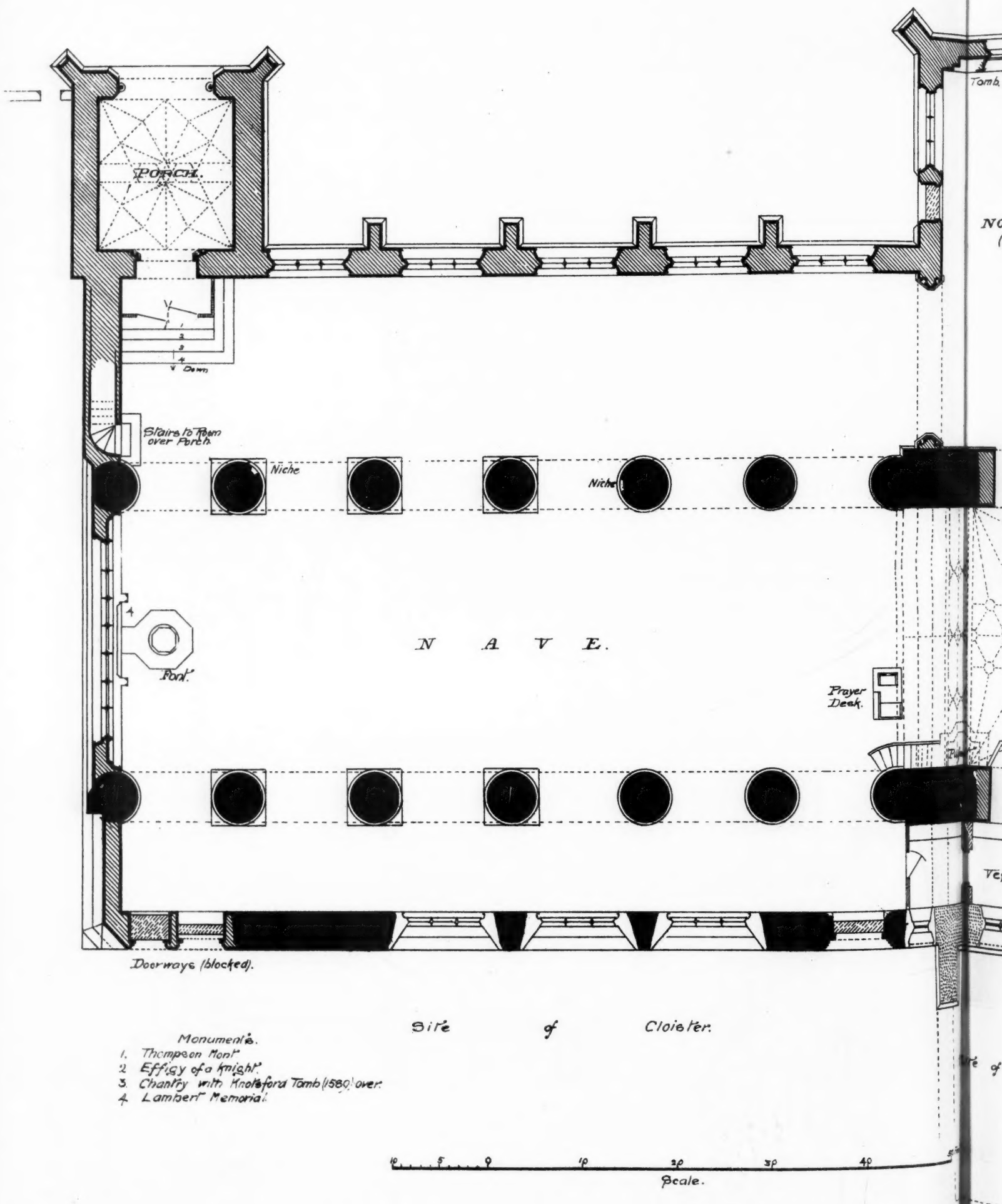
PITAL FROM THE GARDEN.

GREAT MALVERN PRIORY CHURCH.

Ground-Plan.



Monuments.

1. Thompson Mont.
2. Effigy of a knight.
3. Chantry with Knotsford Tomb (1580) over.
4. Lambert Memorial.

Scale.

Norman.
Perpendicular.
Wall built after destruction of Transept.
Modern.

Tomb. Tomb.

NORTH TRANSEPT.
(Jesus Chapel.)

Stalls

PRESBYTERY.

Lectern.

Stalls.

Rail

Site of

→ down.

Lady Chapel.

Organ.

Vestry.

Seat

SAINT ANN'S
CHAPEL

Site of St^h Transept.

P. Marshall Paul.
mens. et delt. 1896.

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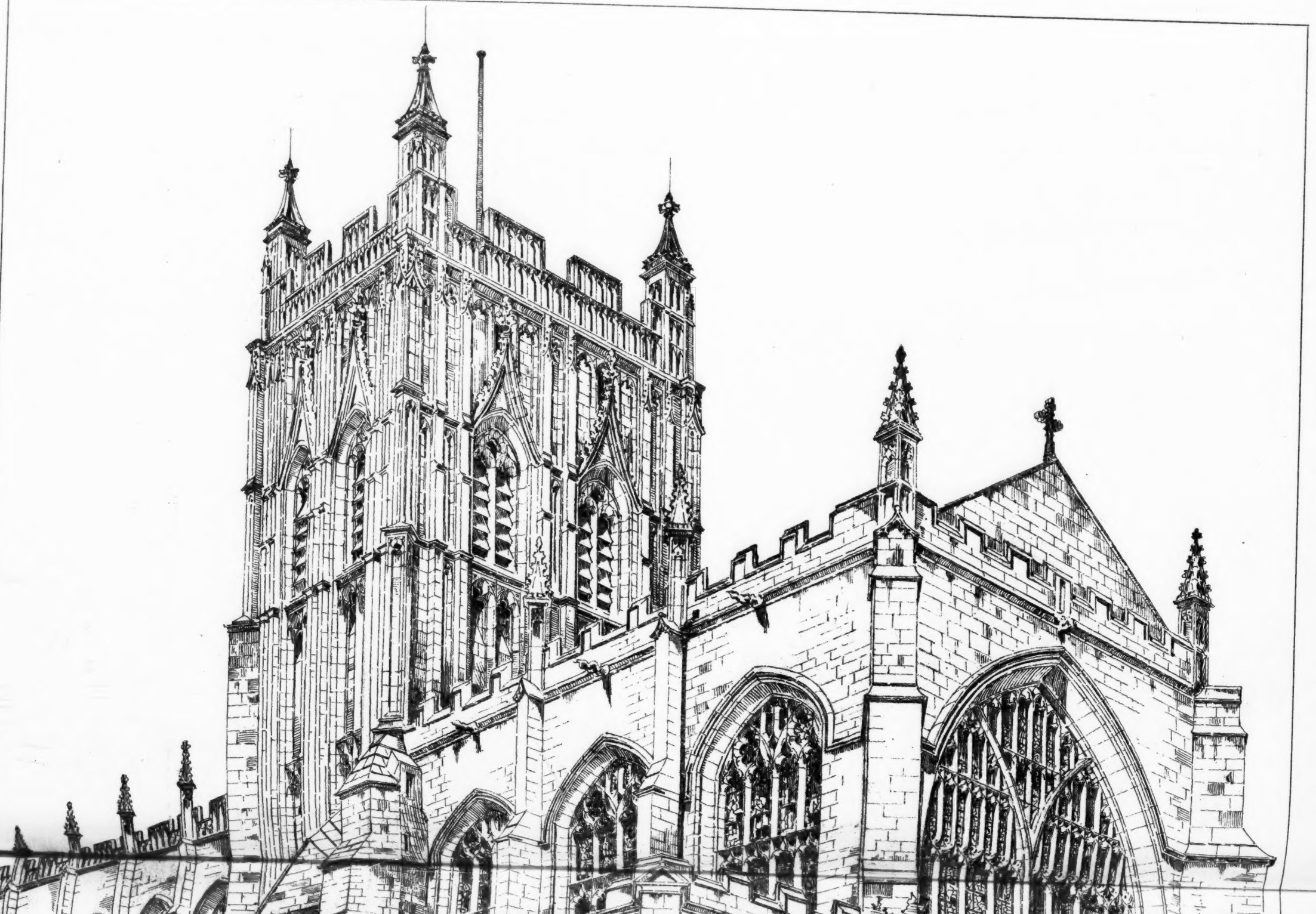

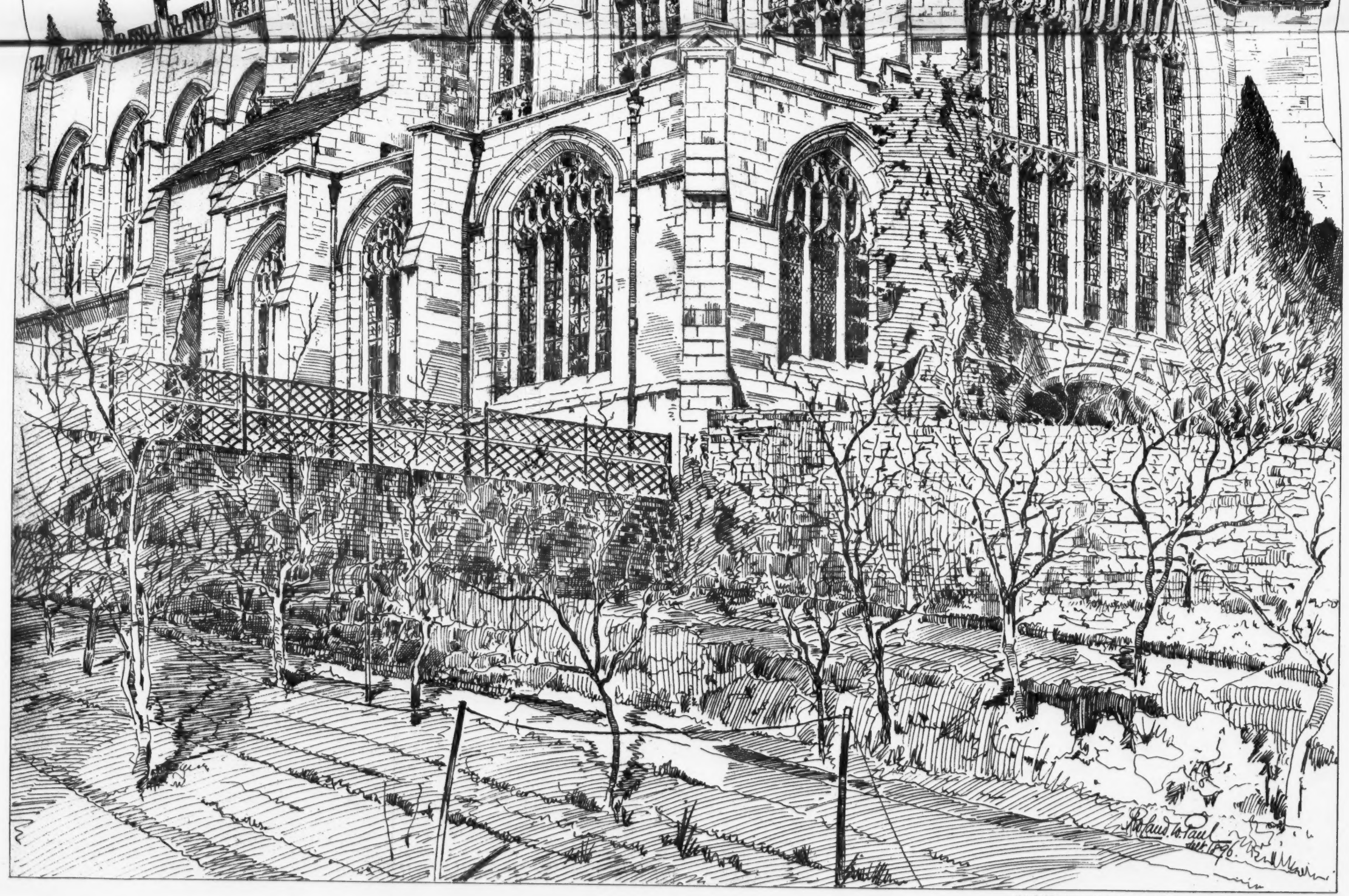

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THE ABBEYS OF GREAT BRITAIN. No. 20. GREAT MALVERN.

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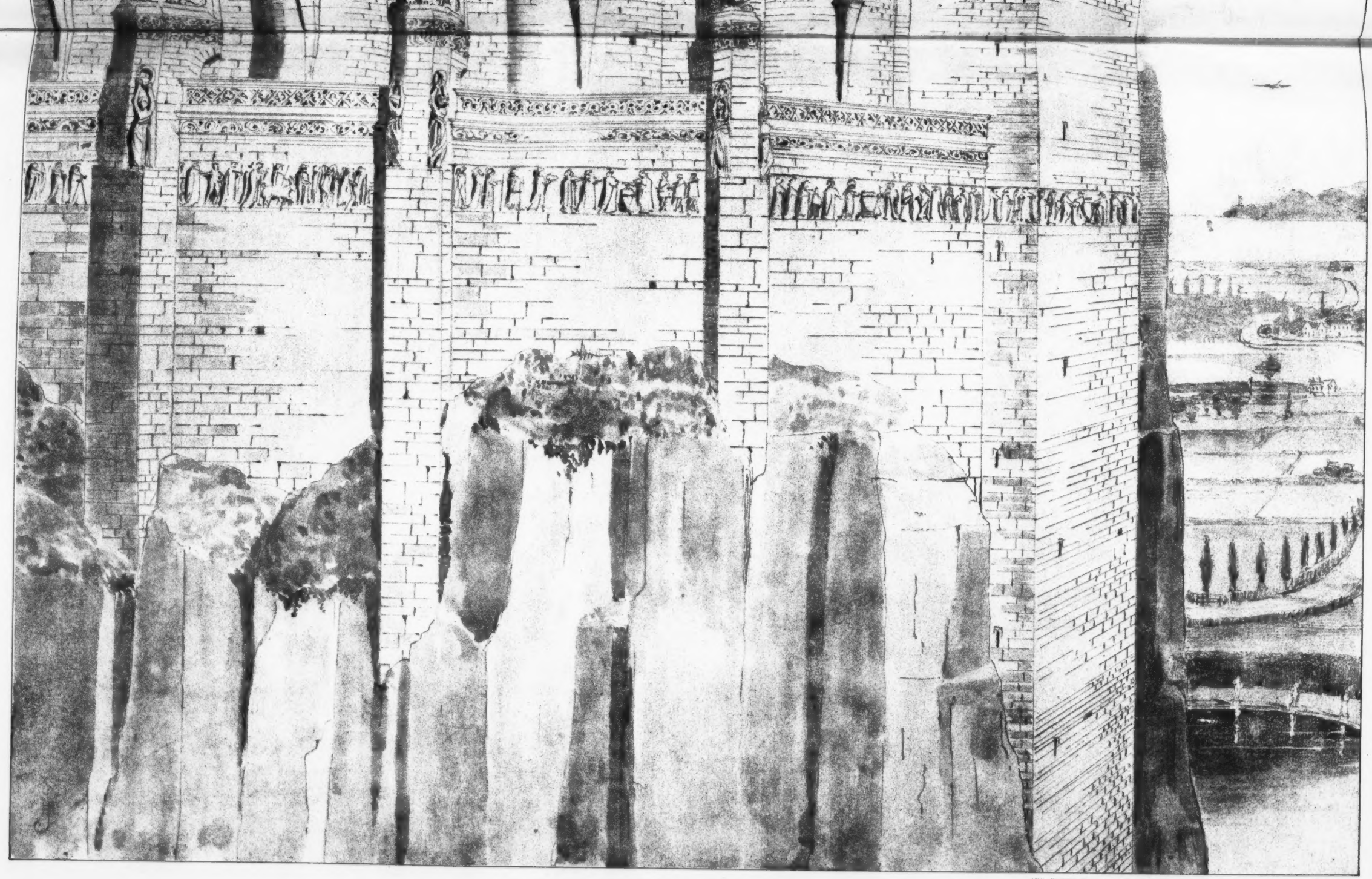

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SKETCH FOR A CORNER OF THE "PALACE OF ART" (SEE TENNYSON'S POEMS).—By the Editor

"I built my soul a lordly pleasure house
Wherein at ease for aye to dwell."

Hackney.

West Ham + Priory . St Botolph Aldgate

City Side Aldgate .

Boro . Bermondsey Priory . St Mary Whitechapel

"The Dove House".

Whitechapel Barras"

Mirones

Hounsditch

"Bleu's Masks"

St Augustine on the Wall & The Papey

City Wall. "Poor Jewry".

Prior's House

Great Court of Priory

St Michaels Church ? + gates of Priory.

Holy-Trinity Priory & Church.

Priory & Church.

West Court of Priory

Bury Stat

Christ Church Cemetery.

St Catherine Cree.

Cree Lane

House of Abbot of Bury St Edmunds

Holy Trinity Priory gate Cree church Lane.

St Andrew Undershaft.

A.W. Brewer

ALDGATE AD 1531.

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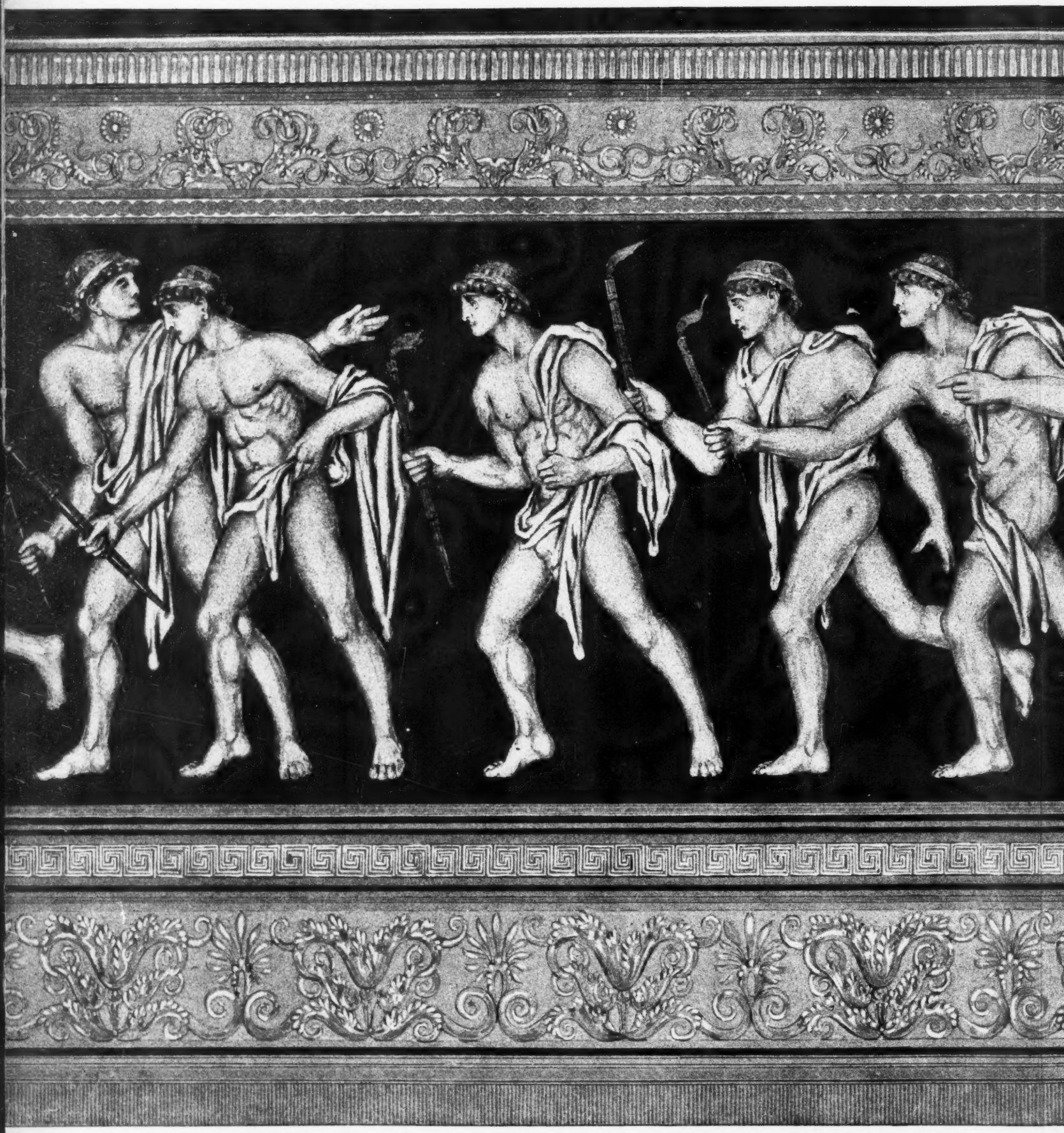
FRIEZE: "VITÆ LAMPADES."—By Mr. John S



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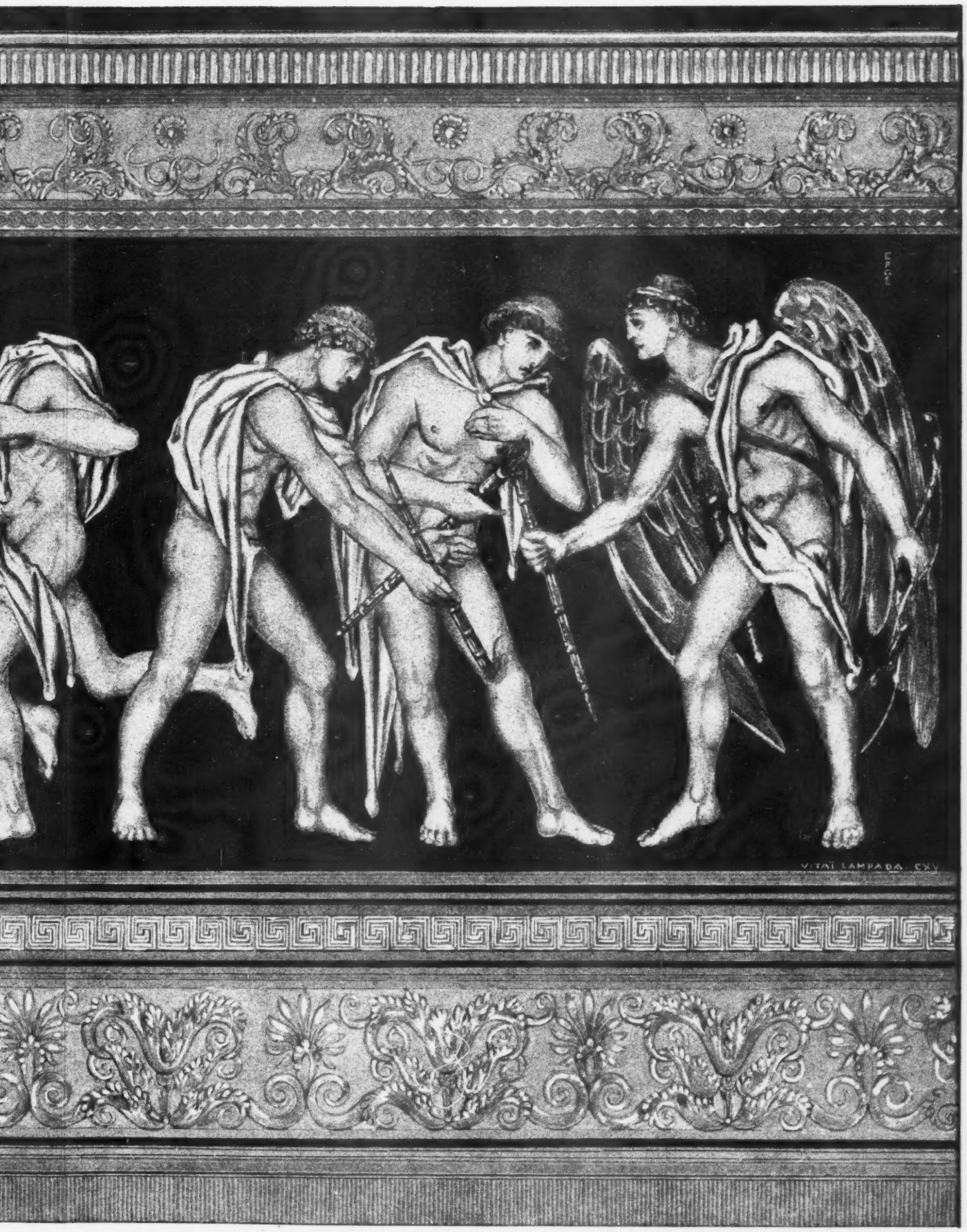

VITAÏ LAMPADA. CXV.

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